COMMERCIAL FERTILIZER

CONSOLIDATED WITH THE FERTILIZER GREEN BOOK

Two Generations of Experience

Anhydrous Ammonia

Nitrogen Solutions
(NITRANA† and URANA†)

ARCADIAN*, the American Nitrate of Soda

A-N-L*
Nitrogen Fertilizer

Urea Products

Sulphate of Ammonia

NYTRON*
(Organic Detergent)

*Reg. U. S. Pat. Off. †Reg. Applied For

Nitrogen Division products are the result of more than 60 years of experience. They are backed by an enviable reputation for high standards of product quality, enterprising research and reliable, dependable service.

Nitrogen Division was formed June 1, 1952, by combining the Sales Agency Department of Barrett Division and the Nitrogen and Organic Sections of Solvay Process Division, Allied Chemical & Dye Corporation.

From its predecessors, Nitrogen Division inherited productive capacity, skilled personnel, long experience and an outstanding record of performance.

In addition to manufacturing uniform, high-quality products which exceed rigid specifications, Nitrogen Division devotes extensive facilities to the efficient distribution and effective utilization of these products.

Rapid, low-cost delivery is assured by the central locations of the two great Nitrogen Division plants at Hopewell, Virginia, and South Point, Ohio, supplemented by warehousing of some products at stock points conveniently located near markets.

Sales are handled by the offices listed below. In addition to experienced sales personnel, Nitrogen Division maintains a staff of technical experts whose services are available to customers without charge.

Nitrogen Division

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N. Y.

Richmond 19, Va. • South Point, Ohio • Hopewell, Va. • Columbia 1, S. C. • Atlanta 3, Ga. • San Francisco 3, Cal.

AA Quality...

for over 85 years
a symbol of quality
and reliability

Mining phosphate rock at A.A.C. Mines, Pierce, Florida.

principal *AA Quality* products

All grades of Florida Pebble Phosphate Rock
AA QUALITY Ground Phosphate Rock
All grades of Commercial Fertilizers
Superphosphate — **Sulphuric Acid**
Insecticides and Fungicides
Phosphoric Acid and Phosphates
Phosphorus and Compounds of Phosphorus
Fluosilicates — **Salt Cake**
Gelatin — **Bone Products**
Ammonium Carbonate

The AMERICAN AGRICULTURAL CHEMICAL Co.

GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N. Y.

30 FACTORIES AND SALES OFFICES, SERVING U. S., CANADA AND CUBA—ASSURE DEPENDABLE SERVICE

COMPLETE SERVICE

LION PROVIDES DEPENDABLE ONE-STOP NITROGEN SERVICE FOR FERTILIZER MANUFACTURERS

LION ANHYDROUS AMMONIA—For formulation. A uniformly high-quality basic product. Nitrogen content, 82.25%.

LION AQUA AMMONIA—For formulation or acid oxidation. Ammonia content about 30%. Other grades to suit you.

LION NITROGEN FERTILIZER SOLUTIONS—For formulation. Three types to suit varying weather and manufacturing conditions.

LION AMMONIUM NITRATE FERTILIZER—For direct application or formulation. Improved spherical pellets. Guaranteed 33.5% nitrogen.

LION SULPHATE OF AMMONIA—For direct application or formulation. Large free-flowing crystals. Guaranteed nitrogen content, 21%.

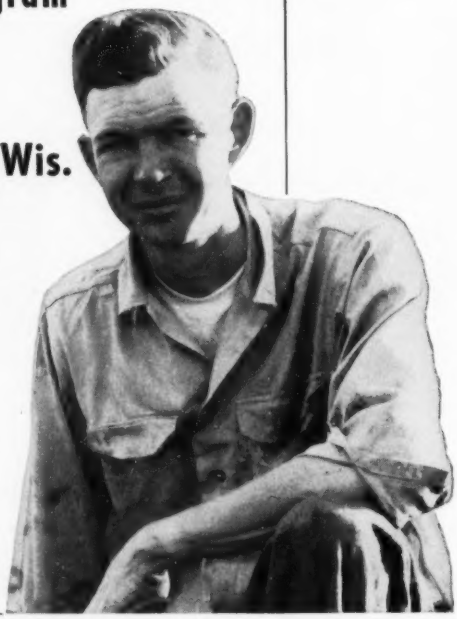
LION

Serving Southern States

Lion provides special technical assistance for fertilizer manufacturers. Write us if you have a formulation problem.

LION OIL COMPANY CHEMICAL DIVISION, EL DORADO, ARK.

High-nitrogen fertilizer program for corn nets $21.59 more per acre for Lee Andrews, Grant County, Wis.



● Here's another young farmer who found out for himself how well a high-nitrogen fertilizer program pays off.

Lee Andrews of Grant County, Wis., broadcast and plowed down 800 pounds of 8-8-8 fertilizer per acre and applied the usual amount of row fertilizer. Comparing the corn yield with that from an unfertilized test plot, he found that this program gave him a net return of $21.59 *more* per acre.

Cooperating with Mr. Andrews in this experiment were George Dehnert, former Grant County Farm Agent, and Prof. C. J. Chapman, of the Department of Soils at the University of Wisconsin.

Bigger yields for farmers mean better business for you

● Experiences like these are convincing evidence to farmers that high-nitrogen complete fertilizers are a paying proposition. The bigger yields pay the fertilizer cost many times over.

And experiences like these are the reason why you're finding the demand for high-nitrogen fertilizers climbing steadily. You're missing a good bet if you're not giving these fertilizer grades special promotion efforts.

You have an extra selling point when you use U·S·S Ammonium Sulphate to supply the nitrogen in these grades. This dry, free-running nitrogen material mixes easily, stands up in storage and handles well in drills or other distributing equipment.

If you'd like more information on U·S·S Ammonium Sulphate, contact our nearest Coal Chemical Sales Office or write directly to United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

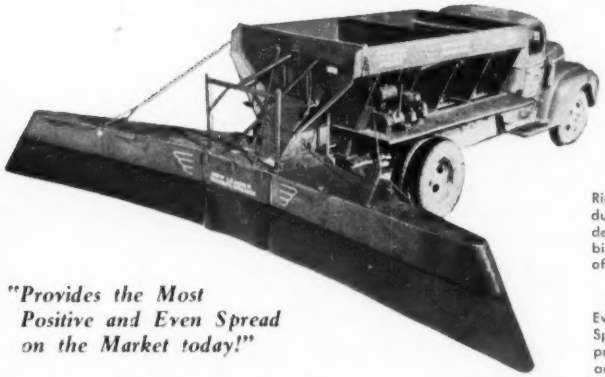
U·S·S AMMONIUM SULPHATE

USS

2-1620

UNITED STATES STEEL

INCREASE YOUR SALES OF COMMERCIAL FERTILIZER AND LIMESTONE



"Provides the Most Positive and Even Spread on the Market today!"

by recommending the "New Leader" SPREADER *for Custom Spreading*

Right in your territory, there are men who can be induced to go into the business of custom spreading. Many dealers of commercial fertilizer and limestone are getting bigger sales volume through the aggressive promotion of the custom spreading idea.

URGE YOUR SALESMEN TO BE ON THE LOOKOUT FOR CUSTOM SPREADING PROSPECTS!

Every time you induce a man to buy a "New Leader" Spreader, you make a friend and a customer. He will promote the sale of commercial fertilizer and limestone and you will make a profit on the fertilizer which he buys from you.

"NEW LEADER" Scores 10 FIRSTS

1. The first successful truck mounted lime spreader that could handle stock-pile lime satisfactorily.
2. The first successful lime spreader with a chain conveyor.
3. The first lime spreader built with Twin Distributor Discs.
4. The first lime spreader with successful center dump.
5. The first lime spreader with a back endgate swinging wide open.
6. The first lime spreader with running boards or catwalks as standard equipment.
7. The first lime spreader with a 24" wide conveyor trough.
8. The first spreader with an all-steel frame and wooden hopper.
9. The first lime spreader with a successful attachment for spreading bulk or sacked commercial fertilizer.
10. And now! The first commercial fertilizer spreader with distributor discs driven at a constant speed by a separate motor. Conveyor chain positively synchronized with speed of rear truck wheels, assuring full width spread at all times and uniform distribution.

The Complete "New Leader" Line INCLUDES

- BULKMASTER
- LIMESTONE SPREADER
- SELF-UNLOADING BULK TRANSPORT
- TAILGATE SAND AND CINDER SPREADER
- HI-WAY MATERIAL SPREADER
- BULKMASTER, JR.
- COMB. COMMERCIAL FERTILIZER AND LIMESTONE SPREADER
- FEEDMASTER
- TRUCK MOUNTED SAND AND CINDER SPREADER

"New Leader" Spreaders spread a minimum of 100 pounds per acre, to any maximum desired up to 4½ tons per acre. Send coupon for free literature and name of your local distributor.

"NEW LEADER" SELF-UNLOADING BULK TRANSPORT

This 20-ton transport with elevator in place is ready to load a "New Leader" Spreader Truck. Eliminates demurrage on freight cars; gets fertilizer to the job quickly. Spreader trucks can stay in field as this is a complete self-unloading unit, leaving tractor free to return for another transport load. Unit divided into four 5-ton compartments. Each may be unloaded independently. Compartments and endgate removable for hauling bagged and packaged goods. Capacity 5 to 25 tons, 11 to 40 feet long.

HIGHWAY EQUIPMENT COMPANY, INC.

Manufacturers of the World's most complete line of Spreaders and Bulk Delivery Equipment

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Spreader ..... Bulk Transport .....

Bulkmaster ..... Complete line .....

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COMMERCIAL FERTILIZER

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ADVERTISING INDEX

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In This Issue

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2267 W. 24th St., Los Angeles, Cal.
Phone REPUBLIC 1-3050

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Don't pin us down to that, please. But, no fooling, the twelve Bemis multiwall plants, strategically located coast to coast, mean that at least one is conveniently close to you. This time-saving means money-saving. Ask your Bemis Man for details.

Bemis

BEMIS BAG COMPANY

General Offices—St. Louis 2, Mo.
Offices in all Principal Cities

Why EXACT WEIGHT Sacking Scales are Popular in the Fertilizer Industry . . .

EXACT WEIGHT Sacking Scales bag, weigh and check in one operation. They handle all free flowing chemicals that will flow from a hopper and ship in a sack. Scales will accommodate multi-wall paper, paper lined, cotton or burlap bags.

With these scales, one man can fill and weigh a hundred pound sack in eight to ten seconds. This rate is with ordinary setup where the unit is fed from an overhead hopper and sacks dropped to conveyor. Thus it is possible for one man to bag over 100 tons of bulk chemicals per day.

The equipment is simple to operate. There are just two controls: bag clamp handle; and feed valve handle. Each has a short travel to open and close positions. The operator makes just four short motions to attach a bag, fill it, weigh it and release to the conveyor. EXACT WEIGHT Scales are built for hard service. Adjustments are few and simple. For protection against rust, the bearings are agate set in metal, and pivots are alloy steel with hard chromed finish. Stainless steel and brass fittings used where practical. Frame and lever casting are primed with red oxide and baked on enamel.

Evidence of their popularity?

These scales have been preferred equipment for over 35 years. In all types of service, their speed, economy, and dependability in the hands of unskilled labor have increased profits for the user. Write for full details today.

SALES and SERVICE
in all Principal Cities
from Coast to Coast
and Canada.

EXACT WEIGHT SCALES
Industrial Precision
THE EXACT WEIGHT SCALE COMPANY

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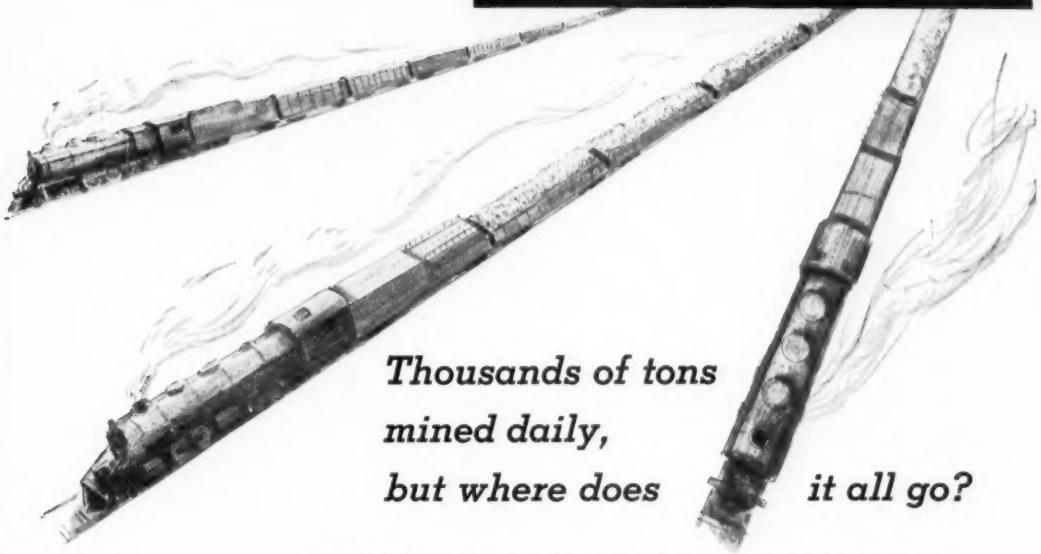
Sulphur



Thousands of tons mined daily, but where does it all go?

LOOK AROUND YOU and let your glance fall on any object. The chances are 1000 to 1 that sulphur played an important role in its manufacture, either as a component part of the finished product or as a processing element.

Take, for example, the very magazine you are reading. If it's average size it weighs about 1 pound. Made largely of sulphite pulp it required about 0.1 pounds of sulphur in its manufacture.

Multiply this 0.1 pounds of sulphur by the thousands of magazines turned out every day and you'll get some idea of the tremendous tonnage of sulphur required for this *single* division of industry . . . the sulphite pulp manufacture.

Sulphur has long been called One of the Four Pillars of Industry. Today's need emphasizes this fact more than ever. Sulphur producers are making every effort to get maximum production from existing mines and to develop new sources of sulphur as quickly as possible.

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas

JUST AROUND THE CORNER

By Vernon Mount

CONGRESS RULES THE US. The President can only advise, can only administer what Congress gives him in the way of laws to work with.

HE CAN APPOINT Administrators with a bias that can twist into new forms what Congress meant to have happen. He can for a time avoid the rules Congress lays down for him.

CONGRESS HOLDS THE PURSE-STRINGS and they can withhold the funds needed for administrative purposes, and thus kill off a function which opposes the meaning of their laws.

STUDY YOUR VOTE for Congressmen and Senators with care, therefore. Make sure they are on the conservative side--if that is your side. Remember how very close we came, just a little bit ago, to wiping out the conservative margin--and throwing the whole Nation on the mercy of the "liberal" element.

GUARD YOUR FREEDOM with your vote.

Yours faithfully,

Vernon Mount

You can always tell a good coffee by its superb flavor . . .

. . . and a Raymond Multi-Wall Paper Shipping Sack by its better quality.

They're

SIFT-PROOF!

DUST-PROOF!

WATER-RESISTANT!

Pack and ship your fertilizer in Raymond Multi-Wall Paper Shipping Sacks . . . the CUSTOM BUILT Shipping Sacks that are made-to-order for your products.

These strong, dependable Paper Shipping Sacks are made in various types, sizes, and strengths. Available printed in multi-colors or plain.

A Raymond representative will be glad to assist you in selecting the perfect Raymond Shipping Sack for your particular packing and shipping needs. Wire, write, or phone Raymond today.

THE RAYMOND BAG COMPANY
Middletown, Ohio

Custom Built!

RAYMOND *MULTI-WALL* PAPER SHIPPING SACKS

POTASH

See us for your requirements of

IMPORTED MURIATE

and also other

FERTILIZER AND FEED MATERIALS

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FERRIC IRON SULPHATE

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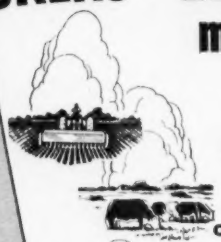
MIXED TO YOUR OWN SPECIFICATIONS

MINERALS ARE ESSENTIAL TO OPTIMUM CROP PRODUCTION



One of the country's foremost producers of Agricultural Chemicals and Soluble Mineral Salts

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And

Special Mineral Mixtures For Fertilizer Manufacturers

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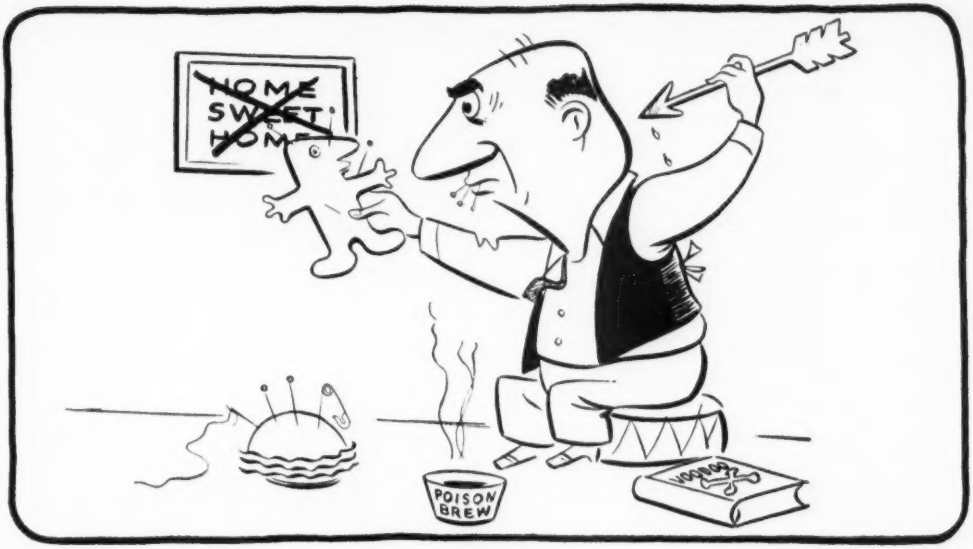
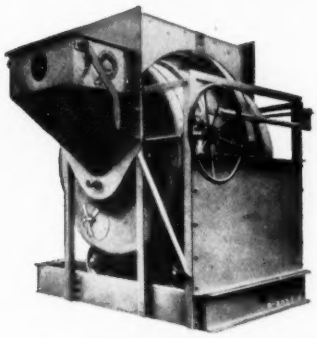


He can't stand that slow mixing cycle!



WORTHINGTON DRUM-TYPE FERTILIZER MIXER, one of the complete Worthington line of industrial mixers of all kinds that incorporate features and advantages brought about during nearly a century of experience in mixer design. Standard sizes of fertilizer mixers, ½, 1, 2, 3-ton capacity.

WORTHINGTON

Industrial Mixers

Wait! Our way is easier! It's a mixer that can boost your daily output as much as 10 per cent—the *Worthington fertilizer mixer*. Secret of the fast mixing action is Worthington's engineered blade design which gives the fastest mixing cycle we know of. You save time with every batch. Mixing is thorough, too, and special mixer design is such that it eliminates these other big problems for you:

THE CORRODED DISCHARGE CHUTE—The Worthington discharge chute is out of the mixer during mixing time. Proper balance makes manual control of chute easy. Pneumatic controls also available.

THE WOBBLY DRUM ROLLER—Worthington drum rollers are of genuine carwheel metal, ground to exact diameter. Compensation for wear to permit perfect centering is accomplished by easy adjustment of drum-roller shafts.

THE HEAVY HORSEPOWER CONSUMER—Worthington's clean, anti-friction construction with specially designed parts assures minimum possible horsepower consumption.

YR.2.4

SEND THIS COUPON TODAY to learn more about how to reduce mixing time with a Worthington fertilizer mixer.

Worthington Corporation
Industrial Mixer Division, Plainfield, New Jersey

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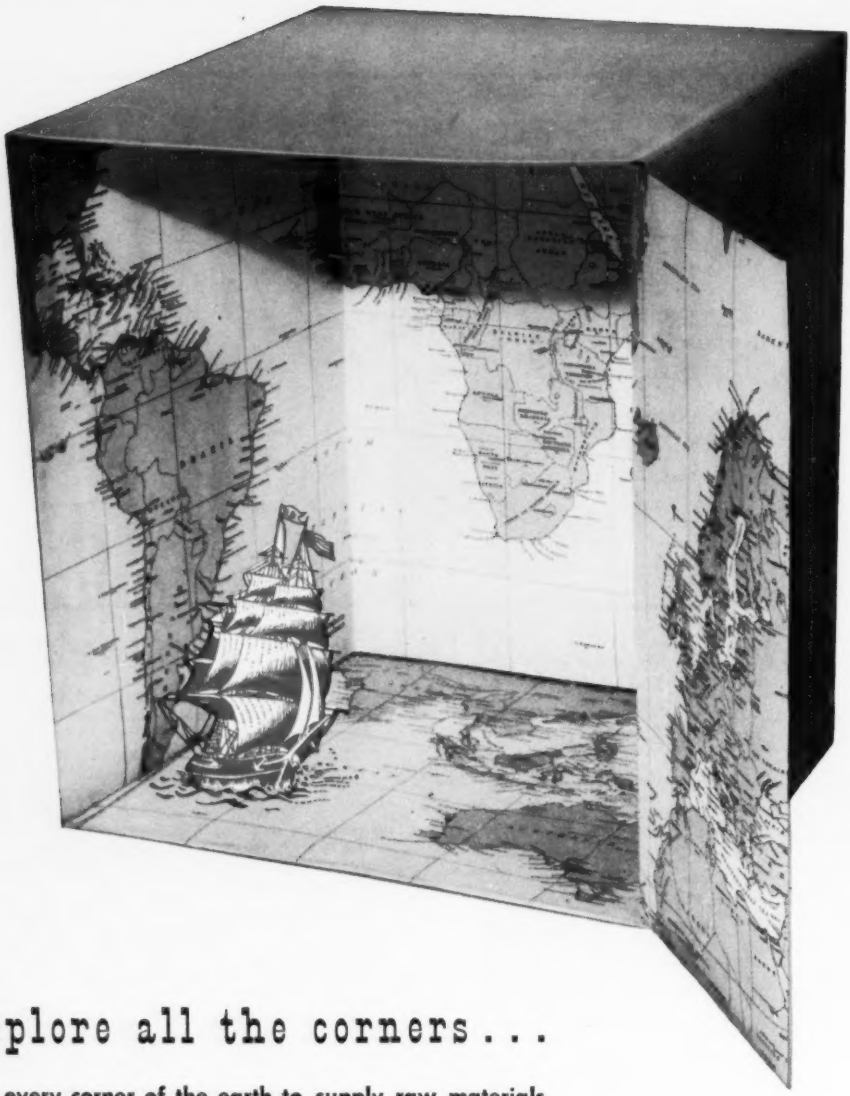
POSITION.....

ADDRESS.....

CITY.....ZONE.....STATE.....



we explore all the corners . . .

We explore every corner of the earth to supply raw materials to manufacturers of fertilizers and agricultural chemicals. If you have a supply problem, write, wire or phone us today.

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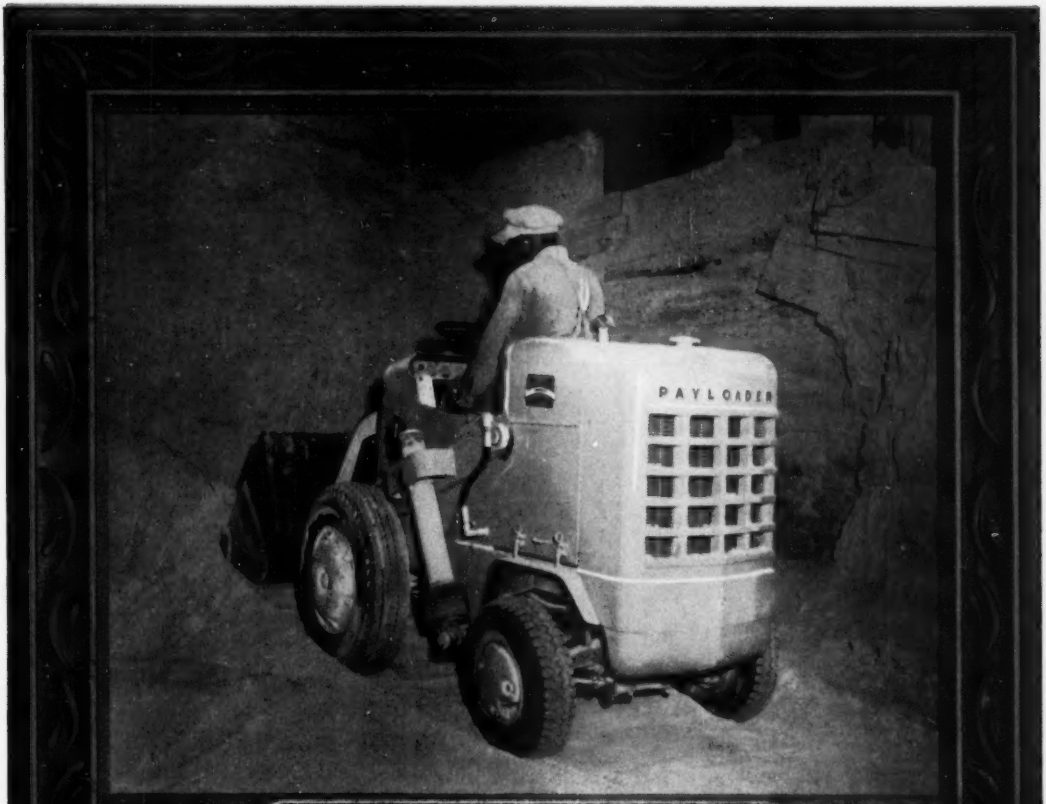

PROFITABLE MANPOWER

This man may have been good with a wheelbarrow and hand shovel, but his productive capacity is several times greater as a "PAYLOADER" pilot. He's happier and so is his boss, because they both make more money.

"PAYLOADER" tractor-shovels are helping fertilizer and chemical plants slash production costs. They actually pay for themselves in a few months doing the many jobs listed here . . . doing them faster and cheaper — and release manpower for more productive work.

These special tractor-shovels are available in seven sizes, from 12 cu. ft. to 1½ cu. yd. to master your jobs both indoors and outdoors. Get full facts *now* on cost-cutting, time-saving, production-boosting "PAYLOADER". The Frank G. Hough Co., 702 Sunnyside Ave., Libertyville, Illinois.

FOR MANY JOBS. *Unload box cars — dig and carry fertilizers, chemicals and all loose materials — feed conveyors, hoppers, baggers, elevators — unload trucks — load box cars — carry bagged materials — clean up aisles, gangways — maintain private roadways — stockpile and carry coal — handle ashes — remove snow — spot cars — lift, haul, push, pull.*

IDEAS PAY

and "Industrial Handling" is full of profitable ideas developed by "PAYLOADER" users. A request on your letterhead gets you on the regular mailing list without cost.

SAY "HUFF"

PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920

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BUT 2!

YOU GET THE PROTECTION OF
NOT 1 BAG, BUT 2, when you buy

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THE LAMINATED BAG

Stronger than burlap alone, **tougher** than paper alone. This **double-thickness** bag with asphalt (or other adhesive) lamination between the burlap (or cotton) on the outside and the paper on the inside is the **perfect answer** to your packaging problems when contamination, weather conditions, grease, acids or water may disturb the clean, dry, freshness of your product.

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Nearest
Office

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DEPT. B1

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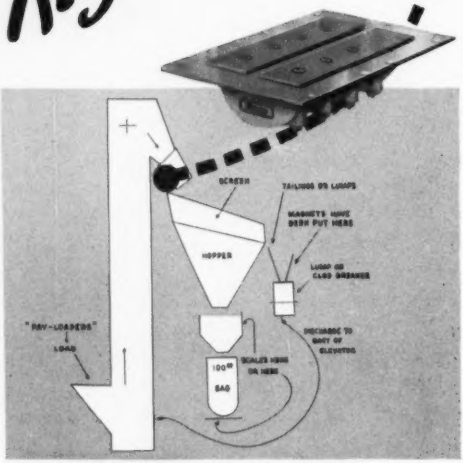
Right Here...



IS WHERE A DINGS PERMA-PLATE MAGNET CAN SAVE YOU MONEY

A non-electric Perma-Plate magnet in the discharge chute of your bagging mill elevator can be a profitable investment.

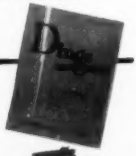
HOW? By removing the nuts, nails, bolts, etc. often found in fertilizer.

WHY? To protect your machinery as well as your customers. In addition, a U. S. Dept. of Agriculture study shows many fertilizer plant explosions are set-off by sparks caused by tramp iron in grinding machinery. A Perma-Plate could prevent this.

THE ANSWER. Dings Perma-Plate magnets are low cost, non-electric, guaranteed permanent. No magnet of this type is more powerful. No electrical accessories whatever are needed. The magnet is simple to install. It will pay you to investigate today.

DINGS MAGNETIC SEPARATOR CO.
4711 W. Electric Ave., Milwaukee 46, Wis.

World's Largest Exclusive Builder of Magnetic Separators for All Industry.



Send for
PERMA-PLATE CATALOG
contains all the reasons why Perma-Plates are an excellent investment for you.

Dings Magnets

weigh all the facts before you build a

Extensive research and investigation of all the facts are necessary to make the building of a fertilizer plant economically sound. Where is the plant to be located? What is its proximity to supply? To distribution? How seasonal are demands in the plant area? What basic ingredients will be used more often? What return can be expected on the capital investment? These and many other facts must be considered in order to produce a sound enduring investment.

Many years of experience in the fertilizer industry have made Harte engineers congnizant of the over-all picture of fertilizer plant design, realizing that certain fundamentals must be followed while specializing the design of each plant. All possible facts are studied and adapted to fit each individual fertilizer plant.

The invaluable experience of Harte engineers is available to aid you in your fertilizer plant design. If you plan to build a fertilizer mixing plant, or an associated plant, the Harte organization of specialists can handle your complete job or any part from original design to an operating plant . . . assuring economy and speed.

Harte Engineers will be glad to discuss your plans with you, without obligation. Write today.

ENGINEERS

CONSTRUCTION MANAGERS

John J. Harte Co.

284 Techwood Drive, N.W., ATLANTA • NEW YORK • HOUSTON • MEXICO, D. F.

Test Pilot

"Just try those springs," the salesman says and his customer, canny as well as pretty, takes him at his word. She wants to be sure what she's getting.

Testing is a good way to double-check Multiwall bags too. Subject them to the toughest going you can. Make sure your manufacturer checks them also—continuously and against rigid performance standards.

In Union's testing laboratories, Multiwalls have to prove themselves constantly—for strength, durability, moisture resistance, sift-proofness, every characteristic you expect of a good package.

Union Multiwalls are *uniformly* high standard. They are manufactured in the world's largest integrated pulp-to-container plant. Only in an integrated plant can first-hand control be maintained over *every step* of the process by which your package is made.

Best proof of the value of this extra protection is in the buying habits of America's largest Multiwall users. Men who purchase more than 85 per cent of the total production of Multiwalls list* dependable quality as one of their most important considerations in choosing a Multiwall supplier.

Insistence on uniformly high manufacturing standards is one of the many good reasons why, to a greater extent each year, these major buyers turn to Union for a substantial share of their increased Multiwall requirements.

More so every day . . .

IT'S UNION FOR MULTIWALLS

TRADE MARK UNION

*August, 1951 research study.

UNION BAG & PAPER CORPORATION • NEW YORK: WOOLWORTH BUILDING • CHICAGO: DAILY NEWS BUILDING

NFA Brochure Outlines Services

A beautifully printed and thoroughly presented brochure has been issued by National Fertilizer Association, outlining their services to agriculture and the fertilizer industry, including the by-laws of the Association. Titled "At your service", it tells the need for more food for more people, the composition of the Association membership, the leadership of the association, the many valuable publications, bulletins and other material made available to members and to agronomists. "All America benefits from this cooperation" is a headline which aptly sums up the facts given. A complete list of members is included.

Four Cotton Meetings Slated October-January

A four-day session of cotton farmers October 22-25 will be held at Bakersfield, California, sponsored by the National Cotton Council. Emphasis will be on the results of studies made by agricultural workers in Southeast, Mid-South, Southwest and Far West on cotton irrigation during the 1952 season when drought conditions were especially bad.

Several hundred from agricultural research and education, as well as representatives of the cotton industry are expected to attend.

December 4-5 at Memphis, Tennessee, National Cotton Council will sponsor the second annual conference on the use of herbicides to control weeds and grass in cotton, at the Claridge Hotel.

December 10-11 National Cotton Council plans a big meeting at the Hotel Peabody, Memphis, for the sixth annual Cotton Insect Control Conference. Last year 800 attended.

January 15-16, the Council will sponsor the 1953 Beltwide Defoliation Conference at the Hotel Peabody, where the emphasis will be on educational phases of defoliation work.

It Seems to Me

by BRUCE MORAN

The drive on soluble plant food concentrates, which is almost as powerful as that behind soil conditioners, has an angle which may be of infinite value to the entire fertilizer industry. For these are high analysis fertilizers, as high as 23-21-17, and promotion of high analysis is something much to be desired.

In other words, the concentrates are a sampling operation which may eventually reach the farmer, and may eventually shake him from his determined fear of innovation.

The national farm leaders, largely because of high freight rates, have become interested in pushing up the analysis. And, of course, agronomists and all those who contact the farmer have long been gently educating him in this direction.

Perhaps the combined effect of results from nitrogen solutions, concentrates, conditioners, insecticides and all the rest of the recent miracles of chemistry, may make the farmer over into an ardent believer that the chemist and the agronomist know what they are talking about.

INDUSTRY CALENDAR

Date	Organization	Hotel	City	State
Oct. 22-23	Safety Section	Conrad Hilton	Chicago,	Ill.
Oct. 23-25	S. E. Reg. Meeting Am. Chem. So.	Ala. Poly. Inst.	Auburn	Ala.
Oct. 30-31	Miss. Fert. Con.	Buena Vista	Biloxi	Miss.
Nov. 5-7	Fla Hort Soc	Soreno	St. Petersburg	Fla.
Nov. 6-7	Pacific N.W.	Gearhart	Gearhart	Ore.
Nov. 10-12	CFA	Desert Inn	Palm Springs	Cal.
Nov. 17	Application	Netherland Plaza	Cincinnati	Ohio
Nov. 18-21	Am. So. of Agronomy	Netherland Plaza	Cincinnati	Ohio
Nov. 19-21	NFA	Roney Plaza	Miami Beach	Fla.
		1953		
Jan. 20	Ga. PFES	U of Ga.	Athens	Ga.
Jan. 21	Ga. Sect., ASA	U of Ga.	Athens	Ga.

50 YEAR OLD COMPANY

Mechanizes Plant

T. F. Bridgers

Fifty years ago F. N. Bridgers founded the Farmers Cotton Oil Company in Wilson, North Carolina. In 1910 they built the plant in Norfolk, Virginia, which has been mechanized over a ten year period. At a later date a third plant was put into operation in Lillington, North Carolina.

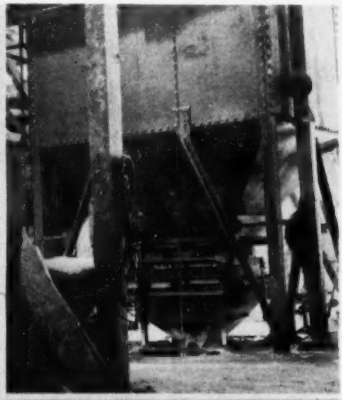
About 1940, Tom F. Bridgers, son of the founder and now president of the company, began to talk mechanization. With C. H. Suber, manager of the Norfolk plant, and S. M. Banks, Superintendent, they planned a program designed to make a better product more efficiently. The Norfolk plant specializes in tobacco fertilizer although makes grades for all other crops grown in the area.

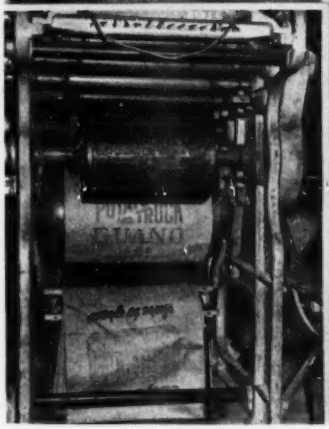
The pictures shown here tell the story. On this page is a group of four, one—of course—showing the Norfolk plant from the air. Next to that is a shot of the six-compartment batching bin, designed and built by Heltzel Steel and Form Co., Warren, Ohio. This was one of the first units of this type to be installed in a fertilizer plant in this area, going into the plant in 1945. During the seven years of operation it has saved real money, and contributed a great deal, Mr. Bridgers says, to the production of uniform, accurate analysis of fertilizer mixtures, it saves the labor of 8 to 10 men.

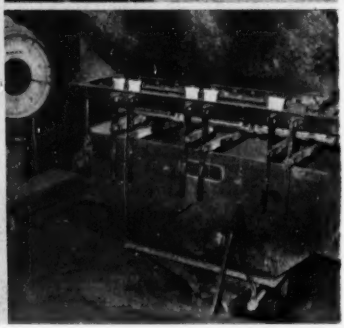
Below this picture is a close-up of the other side of the batching unit, showing weigh hopper, dial scales, and the six levers that control the flow into the batch. These compartments hold about 10 tons each and are filled by Payloader. After the mix is weighed it goes to a screw conveyor, thence to a bucket elevator and through screens into the mixer.

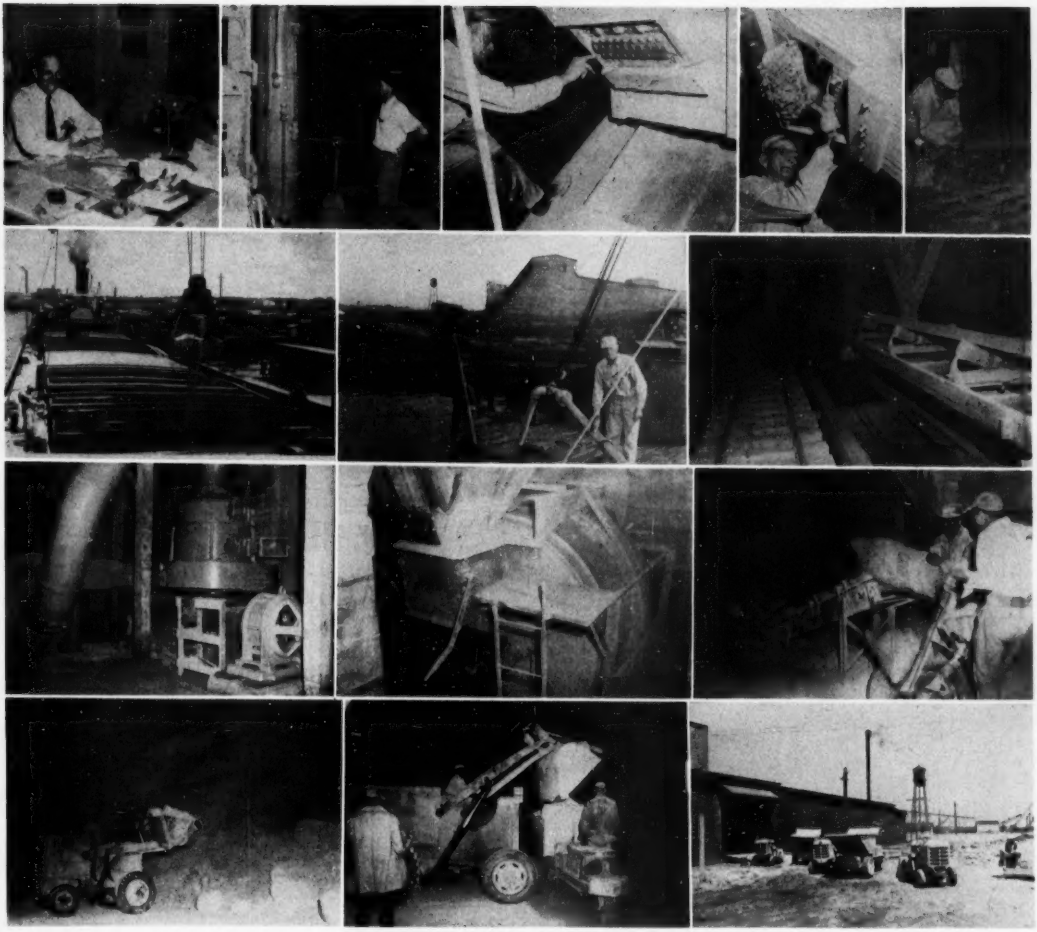
The fourth picture is of the high-speed, two-color printing equipment, made by Schmutz Mfg. Co., which print either paper or textile bags.

On the next page are, first, pictures of Manager Suber at his desk, and Superintendent Banks, shown inspecting the new solution measuring equipment. Mr. Suber is retiring November 1, after 30 years with the Company. (In our September issue we said his retirement was effective









immediately, but this was not correct.)

The next three pictures show the Eriez Mfg. Co. permanent, stainless steel magnets which contribute to the distribution quality of Farmer's fertilizer, especially when precision-built distributors are in use. This is a low cost installation that helps build good will among farmer customers. These are non-electric magnets, and are used on all chutes ahead of the vibrating screens. Farmers Guano Pioneered the use of these magnets. The pictures show, in order, Mr. Banks pointing to the magnet, showing the bits of metal clinging to it, and finally the pile on the floor—a day's collection. The magnets are stripped of tramp metal daily.

Next row shows, first, one of the barges of phosphate rock—brought in that way because water rates mean savings. A clam-shell bucket is used to unload. Next, sulphuric acid being pumped automatically from a barge. Farmers Guano make their own superphosphate but buy sulphuric which comes about 1500 tons to a barge.

The third picture on that row shows the twin conveyor system which runs overhead in the plant. On the left are the rails for a 5-ton special car, pushed by a gasoline powered engine. On the right is the new belt conveyor system, engineered by Continental Gin Company's industrial division. It saves two men's work, and adds flexibility to plant operations, because the 20 inch belt has shuttle combinations which permit material to be routed where it is needed in the plant.

The fourth row shows, first, the new Raymond Mill which grinds

(Continued on page 61)

South Carolina EDUCATIONAL SOCIETY MEETS

S. C. Plant Food Educational Society Meeting

When the South Carolina Plant Food Educational Society met September 10 at Clemson, 150 were in attendance.

Dr. W. A. Albrecht, Chairman, Committee on Soils, University of Missouri, Columbia, Missouri, was the principal speaker. His topic was "Nutrition Via Soil Fertility." His topic dealt with plant and animal nutrition. The following paragraph from his publication summarizes his talk.

"We are slowly coming to believe that much that we now call "disease" should be more correctly labelled nutritional deficiency. As this is more widely granted, there is a growing appreciation of the importance of the soil fertility in nutrition in general. Such recognition is making each of us more ready to take some responsibility in conserving the soil by which all of us want to be well fed and thereby healthy. It is also putting less emphasis on fighting disease and more emphasis on its prevention by better foods grown on better soils."

The following officers were elected for the incoming year: H. B. Davis, Columbia, S. C., Ed. Sallinger, Florence, S. C. were re-elected president and vice president respectively. Mr. J. N. Davis of Leesville, was elected Secretary-Treasurer. The following new members of the Board of Directors were reelected: Hampton Logan, Charleston; S. F. Stoudemire, Sumter; A. G. Sitton, Pendleton; J. N. Davis, Leasville. Hold-over Board members were: Ed Sallinger, Florence; A. D. Kincaid, Columbia; R. J. Zeigler, Columbia; D. M. Avinger, Holly Hill; Bachman Smith, Charleston, S. C.; Louis Smith, Columbia; H. B. Davis, Columbia.

The principal speaker at the banquet was Vernon Grant, a commercial artist and farmer of Rock Hill, South Carolina. His subject was "The Art of Conservation."

Top: Spencer Chemical Company's private plane arrives at airport bringing featured speaker W. A. Albrecht and Spencer Chemical representative to S. C. Plant Food Educational Society meeting. Dr. H. P. Cooper, Clemson, H. B. Davis, Columbia, Dr. W. A. Albrecht, Columbia, Mo., Dallas Cantwell, Atlanta; Second row: Joe Culpepper, Kansas City, Mo., B. D. Cloaninger, Clemson, Dr. S. F. Thornton, Norfolk, F. S. Royster Guano Co., John Sanders, Atlanta, Mr. Claude Byrd, Kansas City.

Bottom: Ed. Sallenger, Florence, S. C., Vice Pres.; H. B. Davis, Pres., Columbia; J. N. Davis, Sec.-Treas., Leesville; Second row: Malcolm A. Rowe, Athens, Ga., Cooper Morcock, Atlanta, Louis Smith, Columbia, P. J. Ziegler, Columbia, Bachman Smith, Charleston; A. D. Kincaid, Columbia, Gus Sitton, Pendleton.

GEORGIA EDUCATIONAL SOCIETY OFFERS NEW GRADES POSTERS

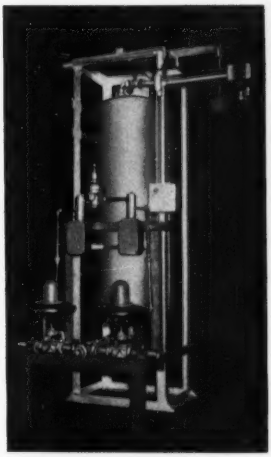
The Georgia Plant Food Educational Society has had printed, and is offering to Georgia fertilizer manufacturers a poster which shows the grades of fertilizer approved and recommended by the College of Agriculture. Printed in green, 28 x 42 inches, it was produced for use in plants, warehouses, loading platforms and the like. A smaller poster is available for use in offices. The College of Agriculture is also producing a small circular giving recommendations for the use of the 10 grades approved recently.

Copies of posters and circular, together with details concerning quantities of these may be had from W. S. Brown, Associate Director, AES, College of Agriculture, University of Georgia, Athens, Georgia.

D-K CO.

Engineers A New Step In Fertilizer Batch Mixing

The Auto-Anhydrous Amonia Tanks
The Auto-Nitrogen Solution Tank



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- **GUARANTEED ACCURACY —**

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Control Officials' Meeting

140 GET TOGETHER IN WASHINGTON

The 6th annual meeting of the Association of American Fertilizer Control Officials was held in Washington on Friday, October 3, 1952 with an attendance of 140.

The States Relations Committee Composed of Fertilizer Control Officials and members of the fertilizer industry met on Thursday evening October 2 and discussed in detail numerous problems confronting the industry and the Fertilizer Control Officials.

After the roll call by states and the report of the Secretary-Treasurer, Park A. Yeats, Vice-President, introduced Dr. J. F. Fudge, president, who gave a most interesting and instructive presidential address. After redirecting the attention of those in attendance to the purposes of the Association, Dr. Fudge gave a report of his activities as president during the year. Throughout he emphasized the importance of industry, control officials, and other agricultural agencies working closely together. Some of the problems presented that will possibly need attention in the future were: The use of Polyelectrolytes for use as soil aggregate stabilizers, and the proper control of bulk fertilizer and fertilizer material to the farms.

The following program was carried out:

Dr. Russell Coleman, President of The National Fertilizer Association spoke briefly of the usages of fertilizer and presented excellent charts to show that even though the percentage increase since 1951 for the South-Atlantic States was great, the percentage of the total tonnage as compared to that for the United States was decreasing due to the fact that the Mid-Western States were using larger quantities.

Paul T. Truitt, President, American Plant Food Council, Inc., spoke on the subject "Prospective Promotions for Plant Food." During the past fiscal year it was estimated that fertilizer tonnage amounted to 22,000,000 tons. He also pointed out that after much thought and study the U.S.D.A., The Land-Grant College and the Defense Production Administration set up a program based on 1951 use, calling for 70% more Nitrogen, 55% more Phosphate and 51% more Potash by 1955. Mr. Truitt stated that the industries part was to produce the fertilizer to meet the goals and to continue to improve quality as quantity was increased. Mr. Truitt closed his well-presented paper by stating that the Control Officials play a most important and vital part in meeting the various difficulties encountered in the process of producing more food where less grew before. On behalf of the Council he pledged his continued cooperation.

Dr. Edwin C. Kapusta, Chemical Engineer, National Fertilizer Association, gave a most instructive talk on the subject "Some Manufacturing Problems and New Developments in Fertilizer Technology." Dr. Kapusta pointed out that the fertilizer industry was entering a period of technological changes and development perhaps unparalled in its 100 year old industry. He stated that new manufacturing processes are being developed, the older ones modified and improved in an effort to provide the farmer with new and better fertilizer. In Dr. Kapusta's discussion he reviewed briefly some areas of possible research in present day process methods and pointed out some recent developments in fertilizer manufacturing which should find a place in the industry in the near future.

Allen B. Lemmon, Chief, California Bureau of Chemistry, talked on the subject "Polyelectrolyte Soil Amendments." Mr. Lemmon pointed out the fact that some of the companies selling soil conditioners or

(Continued on page 60)

Top: Outgoing and incoming presidents of the American Fertilizer Control Officials Association, Dr. J. F. Fudge, State College, Texas, and Park A. Yeats, Oklahoma City. Below: Past presidents of AAFCO shown with plaques presented in recognition of their work for the association. John B. Smith, Kingston, R. I. A. B. Lemmon, Bureau of Chemistry, Sacramento, Calif., Rodney C. Berry, Dept. of Agriculture, Richmond, Bruce D. Cloaninger, Clemson College, Clemson, S. C., Dr. Frank Fudge, College Station, Texas.

Key To Facing Pictures

1. Dr. J. F. Fudge, State College, Texas, and Dr. Russell Coleman, NFA, Washington. 2. Officers and Executive Committee: back row: M. P. Etheredge, State College, Miss., R. W. Ludwick, State College, New Mexico, G. W. Micheal, Ottawa, Canada. Front row: Park A. Yeats, Oklahoma City, H. B. Davis, Concord, N. H., Dr. Bruce D. Cloaninger, Clemson College, Clemson, S. C., and Dr. J. F. Fudge, College Station, Texas. 3. Park Yeats, Oklahoma City, Fred Lodge, NFA, Washington, Dr. K. D. Jacobs, USDA, Beltsville. 4. New Control Officers: H. B. Davis, Concord, N. H., Park Yeats, Bruce Cloaninger. 5. Louis Wilson, Paul Truitt and John R. Taylor, all of American Plant Food Council, Washington. 6. W. A. Minor, USDA, Washington, Dr. W. A. Barnette, Dr. M. F. Farrar, Dr. Bruce Cloaninger, all of Clemson College, S. C. 7. Walter A. Scholl, USDA, Beltsville (Commercial Fertilizer's readers will recognize his name as author of USDA's yearly fertilizer consumption reports). 8. Ed Kapusta, Chemical Engineer, NFA, Washington. 9. Henry Huston, charter member Assn. of Official Agricultural Chemists. 10. Fred Lodge, NFA, Washington, and A. L. Mehring, USDA, Beltsville.










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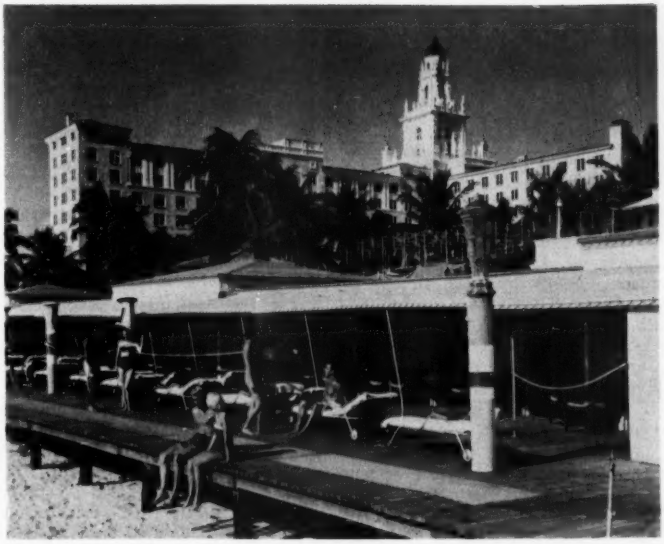
NFA EXPECTS RECORD CROWD AT MIAMI BEACH MEET

Reports from Miami Beach, Florida, indicate that the 26th Fall Meeting of The National Fertilizer Association, to be held at the Roney Plaza Hotel, November 19-21, will be the largest on record. Some 800 persons are expected to attend.

Among the outstanding speakers at the General Sessions on November 20 and 21 will be W. N. Watmough, Jr., Vice President, Mixed Fertilizer Division, The Davison Chemical Corporation, Baltimore, Md., who will discuss the problems of safety in the fertilizer industry; A. H. Moseman, Chief, Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md., who will deal with "New Foundations for Tomorrow's Agriculture;" Warren Garst, Executive Vice President, Home State Bank, Jefferson, Iowa, who will speak on the relationship between bankers and the fertilizer industry; W. M. Fifield, Director of Agricultural Experiment Station, Gainesville, Fla., who will discuss the relationships between State experiment stations and the fertilizer industry; and W. R. Allstetter, Vice President, NFA, who will make observations on recent fertilizer developments and the future outlook.

The Fall meeting dinner, scheduled for Thursday evening, November 20, will be preceded by a social hour to be tendered by H. J. Baker & Bro. of New York City.



Numerous other social activities will be featured. Events for ladies only will include a boat ride, a bus tour, and a fashion show at a luncheon. In addition, for all conventioneers, a private travel agency is offering special post convention tours to Havana, Cuba and Nassau.

The meeting of NFA's Board of Directors will be held at 2 P.M. on November 19.

Watmough Moseman Garst Fifield Allstetter

USDA AND LAND-GRANT COLLEGES PROJECT NATIONAL PROGRAM FOR BETTER FERTILIZER AND LIME USE

More Efficient Use of Fertilizer and Lime is USDA-Land Grant College Goal:

A program intended to bring about more efficient use of fertilizer and lime as one means of increasing food and fiber production, building up the productivity of the Nation's farm land, and increasing net returns to farmers was announced jointly by Secretary of Agriculture Charles F. Brannan and Pres. R. F. Poole of Clemson College, South Carolina, as chairman of the executive committee of the Association of Land-Grant Colleges and Universities.

In making this announcement Secretary Brannan and President Poole emphasized that "The Department and the Land-Grant Colleges and Universities have a joint responsibility for promoting the effective and proper use of fertilizer and lime. The ultimate best use of these elements," they said, "will require an expanded long-range program of research and education geared as closely as possible to the Nation's food and fiber production program and the real need to maintain and build soil fertility reserves. This will require a coordinated effort by the U. S. Department of Agriculture and the Land-Grant Colleges in cooperation with the fertilizer and lime industries, and other public and private organizations."

To assist in providing guidance at the national level in making better use of our present and expanding supplies of fertilizer and lime, a steering committee representing the State Extension Services, the State Agricultural Experiment Stations, and the U. S. Department of Agriculture has been named. The members are:

For the State Extension Services: Marvin A. Anderson, associate director of Extension, Iowa State College, Ames, chairman for Extension; James Gwin, director of extension, College Park, Maryland: D. W. Watkins, director of extension, Clemson; and G. H. Starr, director of extension, University of Wyoming, Laramie.

For the Agricultural Experiment Stations: R. W. Cummings, director of research, North Carolina State College, Raleigh, chairman for the Experiment Stations; H. R. Varney, director, Agricultural Experiment Station, West Virginia University, Morgantown; Phil S. Eckert, director, Agricultural Experiment Station, University of Arizona, Tucson; and N. J. Volk, associate director, Agricultural Experiment Station, Lafayette, Ind.

For the Department: W. A. Minor, assistant to the Secretary, chairman for the Department; Sherman E. Johnson, assistant chief, Bureau of Agricultural Economics; F. W. Parker, soils research director, Agricultural Research Administration; L. B. Taylor, director, Office of Materials and Facilities, Production and Marketing Administration; L. I. Jones, coordinator, Cotton and Grasslands Programs, Extension Service; and H. C. Knoblauch, assistant chief, Office of Experiment Stations.

The attached statement entitled, "A National Program for More Efficient Use of Fertilizer and Lime," describes in more detail the need for a more aggressive fertilizer and lime utilization program and outlines measures for putting that program into effect.

The Program

If this Nation is to be fed and clothed as well as it is now, and if necessary exports are to be provided for, American farmers are faced in the years ahead with the problem of increasing substantially their production of food, feed, and fiber. At the same time they need to improve the productivity of their farmland so that each acre will be capable of sustaining high-level production and of meeting any emergency demands that the future may bring. In view of the limited possibilities for bringing new acreage into production, this increasing output of agricultural commodities must necessarily be accomplished largely through greater production per unit from our present farm plant.

By 1950, American farmers had increased their total output of farm commodities to nearly 40 percent above prewar levels in order to supply a rising demand due to increases in the domestic population, higher consumer purchasing power, the war emergency, and the need to assist in the rehabilitation of the war-torn countries. One of the more significant developments in the agricultural field which has made possible this rapid increase in farm output has been the expanding use of fertilizer and lime.

Looking toward the future, the domestic population presently is increasing at a rate of about 2½ million persons per year. The medium estimate of the Bureau of the Census

indicates a total population of about 190 million by 1975, assuming some slackening in the present rate of increase. This means that by 1975, there will be five persons in this country to be fed and clothed for every four persons in 1950. If economic activity continues at a high level, consumption per person is likely to be greater than in 1950.

Moreover, the Nation's ability to share abundant food supplies with needy people abroad has proved to be one of our strongest assets in working with other nations. Domestic food policy necessarily influences and is influenced by the world situation. This must continue to be the case in view of our position of leadership in world affairs.

These increasing requirements for food and fiber must be met by additional output from American farms.

Fertilizer and lime, when used under proper conditions and in conjunction with other desirable practices, can bring about a very substantial increase in farm production and at the same time make an indispensable contribution toward conserving and improving the productivity of our farm land. The importance of fertilization and liming to the achievement of these objectives is being recognized more by farmers and professional workers in agriculture as is the proper utilization of farm manure and other organic materials. Economic studies show that the expanded use of the fertilizer, lime, and other improved practices needed to accomplish these objectives is profitable.

Up to 1920, the use of fertilizer and lime was confined largely to the Southern and Eastern States. Use has been broadened in recent years both geographically and in terms of increased rates of application.

While domestic production and consumption of fertilizer and lime has increased tremendously in recent years, the supply has not kept pace with farmers' needs. Fortunately, however, opportunities are very great for economically feasible expansion in the production of fertilizer and lime in the United States.

The Department, Land-Grant Colleges, and other groups are working with the fertilizer and lime industries to obtain substantial increases in production by 1955. As a result, farmers can begin to look forward, for the first time in recent years, to more nearly adequate supplies of fertilizer materials. Quantities scheduled to become available by 1955 are expected to be sufficient to permit high level production of food and fiber crops, the adoption of fertilization practices conducive to sustained high level production, and the building of soil fertility reserves. Goals of the USDA-sponsored production expansion program were determined on this basis.

Two completely new fork lift truck models have just been released to industry, according to a recent anouncement of the Hyster Company, Portland, Oregon; Peoria and Danville, Illinois. They are an 8,000-pound capacity truck and a 6,000-pound capacity model. Both are gasoline-engine powered and mounted on pneumatic tires. Both in design and mechanical features, the trucks are refinements of the very latest in lift truck research and engineering.
Descriptive literature can be obtained at any Hyster dealer or by writing to Hyster Company, 2902 N. E. Clackamas St., Portland 8, Oregon.

Prospective Supplies of Primary Plant Nutrients

The following table shows quantities of the primary plant nutrients available for the 1951 crop year, and the goals for 1955:

Achievement of the **nitrogen goal** now seems assured. It is also expected that the **potash goal** will be met. It is not clear at this time, however, as to whether the **phosphate production goal** will be reached. Achievement of the phosphate goal will depend upon developments in the still uncertain sulfur picture, and progress that is made in the adaptation of alternate methods of treating phosphate rock, including acidulation with nitric acid.

It appears at this time that the increased supplies should become available about as follows:

Due to the fact that the phosphate expansion program has only recently been formalized, and the uncertainty that still surrounds the sulfur-sulfuric acid supply picture, it is not possible at this time to indicate the prospective phosphate supplies in the 1953-54 and 1954-55 crop years. Further increases can be expected in these two years, however, and achievement of the 1954-55 goal of 3,485 thousand tons is believed to be a possibility.

Prospective Supplies of Liming Materials

It has been estimated that only about 25 percent of the acreage needing lime was adequately treated in 1950—that 395 million tons of liming materials would be needed for adequate initial treatment of acreage now in need of lime or more lime. Once all acreage in need of liming were properly treated, it is further estimated that annual maintenance would require 47 million tons of liming materials.

While it is recognized that it will take some time to accomplish this ultimate objective, sources of liming materials are widely distributed throughout the United States, and it is not expected that the industry will experience great difficulty in expanding production to meet requirements in most areas. Nevertheless, special attention will need to be given in some areas to sources of supply, quality of product, and problems of transportation.

Crop Response to Fertilizer and Lime

New information on the most effective use of fertilizer and lime supplies is coming out of a nationwide survey by the National Soil and Fertilizer Research Committee of the State Agricultural Experiment Stations and the USDA. Where balanced supplies of plant nutrients are used in combination with other good management practices, striking results may be expected from increased fertilization. For the country as a whole the greatest opportunities for increasing yields through fertilization are in grain and forage crops, which receive comparatively low rates today.

The corn crop offers a spectacular opportunity for increased yields through higher rates of fertilization. In the South, a combination of heavier fertilization, adapted hybrids, and other good management practices could triple the present average yield of 26 bushels per acre. North Central region growers could increase yields on corn by 250 million bushels, by tripling the current rather low average rates of fertilization.

Increased fertilization would boost wheat yields 48 million bushels in the Western States, and would increase average yields in the Eastern States by more than one-third.

Grass, hay and permanent pasture offer a promising source of increased production, if the current low average rates of fertilization are greatly increased. A 30% increase in pasture yields could be achieved in the Northeastern region merely by using the same rate of fertilization now used on corn. When much higher rates of fertilization have been combined with the use of improved grasses and legumes, yields have been increased more than three-fold. Production of forage crops could also be greatly increased by use of much larger quantities of agricultural lime. In the North Central States, for example, the current average hay yield of two tons per acre could be increased 30% by tripling the use of lime, together with relatively small increases in fertilizer use.

Although greatly increased quantities of fertilizer can be used productively, some adjustments can also be made in current fertilizer practice. Heaviest applications are now being used on potatoes, vegetables, tobacco, and other specialty crops. On some field of these crops where heavy fertilizer applications have been made over a period of years, some reductions can be made in fertilizer use, particularly phosphates.

As a practical matter, it is recognized that widespread adoption of optimum fertilization and related practices will require some time to accomplish, and will be affected by the demand level for agricultural products. In all regions, however, experiments show that proper fertilization is a key to the use of other technical gains—improved varieties of crop plants better disease and insect control, and new soil and water management practices. Through higher yields per acre, this combined technology contributes to the maintenance of soil productivity, while making possible the achievement of higher production goals.

Program Needed

How to utilize fertilizer and lime most effectively to accomplish the objectives of increasing food and fiber production, building up the productive capacity of the Nation's farm plant, and increasing net incomes to farmers is a problem of concern to farmers, government, private industry, and the public. This problem requires careful study and planning by all segments of agriculture in order that the best fertilization practices may be fitted into an over-all farming system which will provide for the production of those agricultural products most needed by the people.

The Department and the Land-Grant Colleges and universities have a joint responsibility for promoting the efficient and proper use of fertilizer and lime. Eventual optimum use of fertilizer and lime will require an expanded long-range program of research, education, and other services. The immediate problem, however, is the need to help farmers achieve the best possible results from the increased supplies of fertilizer and liming materials which will be available in the next few years.

This will require a joint, coordinated effort on the part of the U. S. Department of Agriculture and the Land Grant-Colleges in cooperation with the fertilizer and lime industries, and other public and private organizations.

Research

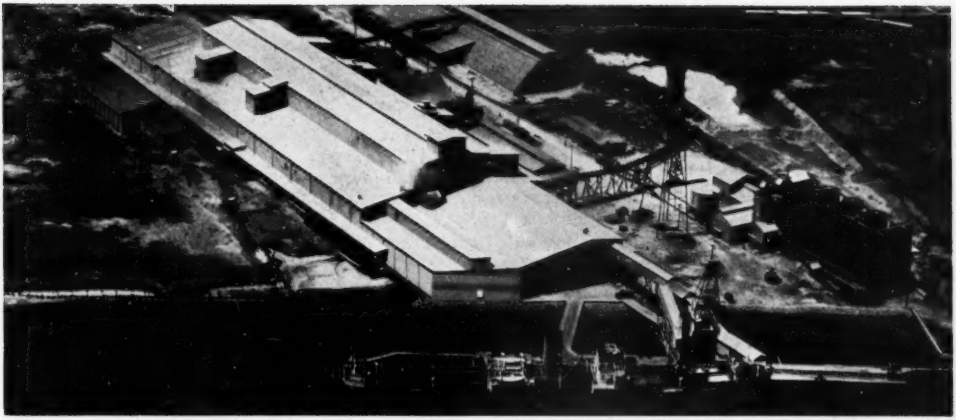
The research being carried on by the Land-Grant Colleges, the Department, the Tennessee Valley Authority, and private organizations in connection with fertilizer, soil, and crop production is contributing to attainment of the program objectives. Special emphasis, however, should be given to the following:

1. **Fertilizer Technology**

Investigate means of overcoming the limiting effect on fertilizer production of the sulfuric acid shortage. This will include studies aimed at developing economical processes that require less sulfuric acid or entirely dispense with its use in the production of phosphates and nitrogenous materials. Full support will continue to be given to measures aimed at the more complete utilization of by-product sources of sulfuric acid, such as smelter fumes in the West and other sections of the country.

There is also need for extensive research on the production of high-analysis mixed fertilizers having improved physical condition and suitable for year-round storage under both factory and farm conditions.

The additional materials to be produced under the expanded fertilizer



One of the largest and most modern fertilizer plants in the Southeast is this Wilson & Toomer Fertilizer Company plant at Jacksonville, Florida. This vast plant manufactures its own sulphuric acid, superphosphates and a complete line of mixed fertilizers. Established 59 years ago, the company now operates manufacturing plants in Tampa, Cottondale and Jacksonville. Its distribution area is Florida, Georgia and Alabama.

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production program will have an average plant nutrient content (N, P2O5, K2O) of approximately 44 percent, as compared with an average plant nutrient content of 24 percent in mixed fertilizers presently produced. There is particular need for research to develop methods of processing these high-analysis materials whereby the most economical and efficient types and grades of mixed fertilizers will be produced.

2. **Marketing of Fertilizer and Lime**

Study methods of fertilizer and lime distribution and marketing with a view to reducing the cost between the producer and the consumer. Special attention should be given (1) to studies of the bulk distribution of fertilizer directly to the farm, including fertilizer materials and mixtures, with particular reference to distribution costs and the possible savings to the consumer that might be effected thereby; (2) to the relation of the plant—nutrient concentration of fertilizer to the farm cost of such nutrients; and (3) to problems of packaging and warehousing so that materials can be satisfactorily stored during the off season.

3. **Methods of Fertilizer and Lime Application**

Research workers in industry and in government, cooperating through the National Joint Committee on Fertilizer Application, have made distinctive contributions in the field of fertilizer application. Some additional needs for advancing fertilizer application practices in the future include:

(a) Research and discussions to develop more uniform agreement as to proper fertilizer placement so equipment manufacturers can proceed with the design and production of special equipment adapted to wider areas. Included in these needs are equipment for liming and fertilizing subsoils, machines for precision placement of fertilizer at variable points in relation to seed location and drills for handling new types of materials.

(b) Research on economical equipment for distributing new types of fertilizer materials including liquids and compressed gasses.

(c) Research on the application of larger amounts of fertilizer by side-placement to save extra application operations.

(d) Development of equipment and procedures for fertilizer and lime application on small farms where farm machinery overhead costs must be low.

(e) Research on fertilizer distribution by aircraft.

4. **Soils and Plant Analysis**

Further research is needed to increase precision in determining fertilizer needs based upon analyses of soils and plants.

5. **Physical Response and Economic Levels of Use**

Economic interpretation of response to fertilizers requires knowledge of the full length and shape of the response curve. Therefore, data on response to a single variable nutrient in the presence of different levels of other nutrients are needed to furnish the physical basis on which economic interpretation must rest. The different rates used in experimental work conducted for this purpose should cover a wide range, including rates at which no appreciable increases in yields are obtained.

Along with adequate crop response data, information also is needed on (a) the response and relative cost of elements from different sources and (b) the costs of applying a given amount of plant food by different methods as well as in different forms. Moreover, information is needed on the contribution and role of fertilizer in a complete cropping rotation or sequence as it relates to cropping practices and livestock production on the farm as a management unit.

Data showing increments in yields associated with each additional unit of application permit determination of the most profitable rates for farmers in different positions with reference to available capital and tenure status. The farmer with limited funds must plan his expenditures not only with reference to the quantity of fertilizer applied but also must determine the most profitable combination of fertilizer and other farm resources. Furthermore, this combination is influenced by the tenure arrangement—how the costs and returns are divided.

6. **Evaluation of Unexhausted Soil Improvements**

Further study is needed in connection with the evaluation of unexhausted resources added to the soil, particularly as related to the problem of tenure arrangements, so that guides can be provided for the equitable division of costs and returns between owners and tenants and reimbursement of a vacating tenant for the improvements he has made.

7. **Statistics**

Adequate statistical information concerning use of fertilizers is essential to any accurate appraisal of a current situation or developing trends in usage. Steps should be taken to encourage collection of such data in areas where no statistical report is now being made, and to expand those now being made to give more information concerning fertilizer usage on different soils and crops.

Special periodic surveys of use of fertilizer and lime by farmers should be made in order to obtain information as to applications on different crops by areas and other information concerning particular problems. To accompany such surveys, there is much to be gained by making in a systematic manner, periodic inventories of the nutrient level status of soils in order to evaluate the fertility trends resulting from current cropping practices and fertilizer usage.

EDUCATION

The Department will be responsible for (a) assembling materials of National and regional application and usefulness, (b) enlisting the help of interested national organizations in a position to add impetus and to contribute to the program, and (c) encouraging the participation of the radio, farm, press, and other nationally organized public media which can contribute significantly to the success of the program.

McCloskey Fertilizer Plants are Designed and Built *to Resist Corrosion*

Resistance to corrosion is one of the important factors taken into consideration when McCloskey designs and builds your fertilizer plant. Substantial and compact sections are provided for the frame which is readily protected with acid resistant coatings to insure long life and low maintenance.

Other design advantages include greater resistance to damage than wood frame or light, space consuming truss construction. The danger of fire loss is eliminated. Clear overhead is provided for conveyor systems, high stacking of material, and the need for eccentric profiles in fertilizer manufacturer are all engineered into your building by McCloskey. Before you plan a new plant ask McCloskey to give you the benefit of their many years of experience in this field. We will save you time and money.

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Within the States, leadership in the educational program will be the responsibility of the Cooperative Agricultural Extension Service as the educational arm of the Department and the Land-Grant Colleges.

Participation of Other Groups

In planning and carrying out the educational program the Cooperative Agricultural Extension Service will solicit the active participation of Agricultural Mobilization Committees and other interested persons and organizations, including fertilizer and equipment dealers and distributors, bankers, and farm organizations.

Activities Requiring Special Emphasis

It is contemplated that in conducting the educational program, full use will be made of all established channels for reaching farmers and other interested parties. In addition to the educational activities now in progress, special emphasis will need to be placed on the following:

1. **Preparation and Dissemination of Information**

The preparation and dissemination of information designed to assist farmers in making optimum use of fertilizer and lime on their own farms.

2. **Additional Demonstrations** — Additional demonstration of fertilizer and lime use on individual farms to emphasize local adaptations of recommended practices.

3. **Soil and Plant Tests** — Use of soil and plant tests to:
   a. Stimulate interest in proper plant nutrition, and
   b. Aid in the determination of lime and fertilizer needs on the individual farms.

4. **Economics of Crop Response**— Design of educational materials so as to provide in simplified form the economic interpretation of crop response to fertilizer and lime use and related practices. Such information will need to take into account the requirements of each individual crop as grown on different soils and under different farming situations so as to contribute most to development of a balanced fertilizer program for the farm as a unit.

5. **Financing Soil Improvement**— Carrying educational work to both farmers and lenders which will demonstrate the soundness of credit for financing soil improvements and other productive investments, and will indicate how additional returns may be used for repayment of loans.

Other Facilitating Activities

Certain activities in addition to those in the fields of research and education can contribute substantially to a balanced program for efficient and profitable utilization of fertilizer and lime. Such activities include:

Technical and Financial Assistance

1. Technical and financial assistance to farmers and ranchers in developing and executing their individual farm plans, taking into consideration the capabilities of the soil, systems of farming, good farming practices, and the availability of labor, equipment, and capital, and assistance in carrying out approved soil and water conservation practices.

Credit

2. Making it possible for farmer to obtain credit as needed to purchase appropriate kinds and amounts of fertilizer and lime for balanced systems of farming including, where necessary, loans by government agencies to eligible farmers who are unable to obtain adequate credit from banks and other private lenders.

Leasing Arrangements

3. Aid in developing leasing arrangements which provide for equitable sharing of costs and returns, thereby creating tenure situations which are conducive to the use of most profitable quantities of fertilizer and lime.

ORGANIZATION

1. A Steering Committee representing the Department and the Land-Grant Colleges will serve at the national level in guiding programs in connection with utilization of fertilizer and lime toward the objective of optimum results in terms of yields of needed crops, soil improvement, and farm income.

2. Within the states and counties leadership will be the responsibility of the Land-Grant Colleges working with local representatives of other interested state and Federal agricultural agencies and private groups.

3. The National Soil and Fertilizer Research Committee will take steps to encourage appropriate state agricultural workers to interpret and prepare for dissemination, in a form suitable for educational purposes, the available data on crop response to increments of plant nutrients and lime and profitable levels of use under different conditions.

4. The continuing cooperation of the fertilizer and lime industries and other interests is invited to the end that industry activities will be coordinated with the National Fertilizer and Lime Utilization Program.

5. The continued collaboration and participation of the state fertilizer control officials and the Tennessee Valley Authority will contribute substantially to the success of the program.

Longaker Opens Brokerage Concern

Chas. T. Longaker, Auburn, Indiana has announced the opening of Longaker & Company, 477 West 7th Street, Auburn, Indiana, as Importers and Brokers of heavy chemicals for the commercial fertilizer industry.

Mr. Longaker has been engaged in the marketing of chemicals for over 24 years. He organized Longaker Mills, Inc., January 1, 1947 and constructed a commercial fertilizer plant at Butler, Indiana whose products received immediate acceptance in Indiana, Ohio and Michigan. The Federal Chemical Company of Louisville purchased a substantial portion of Longaker Mills, Inc. on August 1, 1950 with an option to purchase the entire company on September 1, 1952. Mr. Longaker has resigned as Board Member and President of Longaker Mills, Inc. effective September 1st and will devote his time to the marketing of heavy chemicals and fertilizer materials, offering complete service to manufacturers of commercial fertilizer.

Norfolk, Va. • Charleston, S. C. • Tampa, Fla. • Jackson, Miss. • Columbus, Ohio

300 EXPECTED AT *Desert Inn* WHEN *CFA* MEETS NOVEMBER 10-12

The California Fertilizer Association will hold its Twenty-Ninth Annual Convention at The Desert Inn, Palm Springs, California, on Monday, Tuesday, and Wednesday, November 10, 11, and 12, 1952. A program of interest, not only to those who make up the fertilizer industry, but the agricultural leadership of California and Arizona, has been developed by the Program Committee of which Byron Reynolds, of Los Angeles, is Chairman, according to President S. B. Tatem. The total attendance will exceed 300.

Featured will be several outlines illustrated with colored slides covering fertilizer tests which have been conducted during the current year by the University of California, College of Agriculture, and Experiment Stations. The Soil Improvement Committee of the California Fertilizer Association will present the bulk of the program. The Bureau of Chemistry of the California State Department of Agriculture will present a report on its activities during the past year, and in addition will feature papers on the current rash of chemical soil conditioners, and on protection of plant employees against preventative accidents.

Of interest to both the fertilizer industry and farm leadership to be present will be an outline of California's water development plan and its expected development during the coming ten years, with an estimate as to the number of acres of new and currently marginal farm lands to be brought under cultivation because of this new water. This outline will be given by Professor T. R. Simpson of the Irrigation Department, University of California.

Dr. Russell Coleman, President of the National Fertilizer Association, Washington, D. C., will speak on "Where is All the Fertilizer Going?" Paul T. Truitt, President of the American Plant Food Council, Inc., will outline the USDA-Land-Grant College Fertilizer Use Program in conjunction with which Mr. John J. McElroy, Director of Programs, Agricultural Extension Service, University of California, Berkeley, will discuss California's responsibility.

Z. H. Beers, Executive Secretary of the Middle West Soil Improvement Committee, Chicago, will speak on "Middle West Industry Helps Farmers to Help Themselves." A report on the Japanese fertilizer industry and the post-war development of Japanese agriculture will be given by William E. Snyder, Wilbur-Ellis Company, Los Angeles, who has just returned from a three-month assignment there. Weller Noble, President of the Pacific Guano Company, Berkeley, and past president of the CFA, will outline the current status of supply of nitrogen, phosphate, potash, and organic materials.

The Annual Business Meeting of the members of the Association, which will be held on Monday afternoon for the election of three directors to replace three who will be retiring, and to approve the budget for the coming year, will be followed by a showing of the National Fertilizer Association's new colored motion picture in sound, "The Grasslands Miracle."

There will be two cocktail parties, each sponsored by a member of the Association, the first on Monday evening under the auspices of Balfour, Guthrie & Co., Ltd., and the second on Wednesday evening prior to the annual banquet, sponsored by the American Potash & Chemical Corporation. Following the banquet on Wednesday, a drawing will be held for ladies' door prizes, and dancing will be enjoyed until 1:00 a.m.

The entire day on Tuesday, November 11, has been set aside for fun and recreation. Featured will be separate golf tournaments for the men and the ladies. For those who are not interested in competitive sports, there will be swimming, trail riding, tennis, bowling, bridge, canasta, or just browsing in the beautiful Palm Springs specialty shops. That noon the ladies will be the guests of the Association at a cocktail party and luncheon at the beautiful Shadow Mountain Club located in Palm Desert, fifteen miles south of Palm Springs. A chartered bus will transport them and will bring them back by way of the beautiful native palm canyons and through two of the commercial date palm groves, of which there are many located in the area. An outdoor steak broil will feature the Tuesday dinner hour.

Around the Map

ALABAMA

Greenville Plant Food Company, Greenville, have opened a modern fertilizer plant, producing **Bama's Pride** fertilizer. **K. B. Maddox** is general manager.

ARKANSAS

R&S Liquid Fertilizer & Implement Co., Madison, has been incorporated for $50,000 by **Robert E. Riffey, Thomas D. Seay, Jr.,** and **Dale W. Horton.**

CALIFORNIA

Chemical Corporation, Oleander, are building in that San Joaquin location a $5,000,000 operation to produce anhydrous ammonia at the rate of 100 daily tons. Natural gas and the big surrounding market were reasons for the choice of location.

* * *

Filtrol Corporation's plant at Vernon, announced here last month, is headed by President **Wright W. Gary.** The headquarters are at Los Angeles.

* * *

Alkemi Soil Builder, Santa Ana, has been purchased from **Dr. A. P. Koentropp** by **Fred J. Knauer** who will operate it under the new name of **Western Soil Builder Co.** from Escondido. Alkemi is an organic soil builder.

COLORADO

National Farmer's Union, Denver, in addition to building an atomic-bomb-proof national headquarters, are raising six million dollars to develop huge potash holdings in New Mexico. Secretary-Manager **C. E. Huff** says test drilling has demonstrated the presence of "many millions of tons." They hope to put raw phosphates on the market as early as next year, and potash fertilizers by 1954.

FLORIDA

Coronet Phosphate, Lakeland, 98% of whose outstanding stock has been acquired by **Smith-Douglass,** as has been reported here in July and August issues, will make no changes in management or customer relations. The amount involved was around $6,125,000. **John R. Sheffield,** who has been Coronet president for seven years, will continue in that office, and is one of a five-man board to administer the affairs of the subsidiary, as is **George H. Burt,** for a number of years secretary and treasurer of Coronet. The other members are Smith-Douglass men: **Ralph B. Douglass,** president; **Willard R. Ashburn,** counsel and director; and **W. B. Copeland,** vice-president.

* * *

International Minerals and Chemical has been cleared by the DPA to put some $800,000 into facilities for the production of uranium in their Polk County operation.

GEORGIA

Empire State Chemical Co., Athens, has been granted a $250,000 loan by the Small Defense Plants Administration for the purchase principally of raw materials.

Pittorganite, made by Kelly Agricultural Products Co., McKeesport, Pennsylvania contains 5½% N and from 3½ to 4½% P_2O_5. This was incorrectly stated in our September issue.

KANSAS

Eagle-Picher Company will build a $4,000,000 zinc-roasting and sulphuric acid plant at Galena, and **Missouri Farmer's Association** will build a companion fertilizer plant nearby, just across the state line on the Missouri side near Joplin. Both are to get under way soon and planned for completion early in 1954. About 240 daily tons are to be produced in the Eagle-Picher plant.

KENTUCKY

Elco Products, Inc. Ashland, has been capitalized at $10,000 to produce insecticides.

MAINE

Northern Chemical Industries, which is controlled by **Summers Fertilizer Company,** and which operates the only sulphuric acid and superphosphate plants in Maine will build a $1,500,000 nitric acid plant near Bangor at Sandy Point, using the TVA process. A total of $2,100,000 will be spent on new construction, including the adaptation of present superphosphate production. The concern will produce a complete fertilizer of ammoniated superphosphate mixed with muriate of potash.

MARYLAND

Wm. B. Tighman Company, Salisbury, publish, as many of our readers know because we quote so often from it, a magazine known as "The Tiller" in the current issue of this appeared the following, which we

believe worth reprinting here, complete:

YOUR BANKER CAN HELP YOU

Bankers need to know more about fertilizer as a super-sound investment. They also need more specific information about the effect of fertilizers on the immediate net profit of farmers.

When we sell a farmer a ton of fertilizer, we do the farmer a much bigger good deed than we do ourselves. When he buys $100 worth of our fertilizer, he usually will, within the same year, get his $100 back plus from $100 to $500 or more from increased crop yields. You can compare that with most any other investment and hardly ever match it.

An investor who receives an annual return of 10% on his money usually thinks of himself as pretty lucky. But when the farmer-borrower invests money in fertilizers, he gets from 10 to 50 times a 10% return.

Uniformly experimental data on fertilizer response, when reduced to dollars and cents terms, show that when a farmer invests in fertilizer, he gets an extraordinary financial return. This is far out of proportion to the return on most investments.

In many areas, however, the experimental data have not been reduced to dollars and cents terms. Not only the fertilizer industry, but all American agriculture, will benefit if bankers, landlords, and other interested groups can be shown the financial returns from fertilizer usage and from other agricultural practices that bring about high crop yields.

The cost of producing a bushel of corn at 100 bushels or more to the acre was less than half the per-bushel cost of low-yield corn and that the high-yield produced was in position to withstand decreases in the price of corn and still make a profit. But low-yield corn crops, if prices fell, would show an increasing net loss. In the case of high-yields the data showed that a farmer could actually make a profit if corn fell to $1.00 a bushel. Yet in the case of low-yields, he wouldn't make any money with corn at $1.50 a bushel.

It would be profitable—to all concerned—if the banker would solicit farmers' loans as well as their deposits. A crop loan interest charge is a very small item of expense in crop production. Reports of some banks in agricultural sections show a surprisingly small part of their loans to farmers for crop production.

THE WEBSTER FERTILIZER BUCKET

● Specially designed to handle fertilizer wet or dry. Webster engineers have provided more metal at points subjected to most strain and wear for extra months of service.

● Webster malleable iron fertilizer, combination steel and malleable chains and sprockets give longer, trouble-free performance under severe operating conditions. Enjoy less downtime; specify Webster equipment for your next replacement installation or your original equipment purchases.

WEBSTER MANUFACTURING, INC.

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● Write for free folder describing the Webster Fertilizer Bucket. It fully explains its improved design and performance. No obligation, of course!

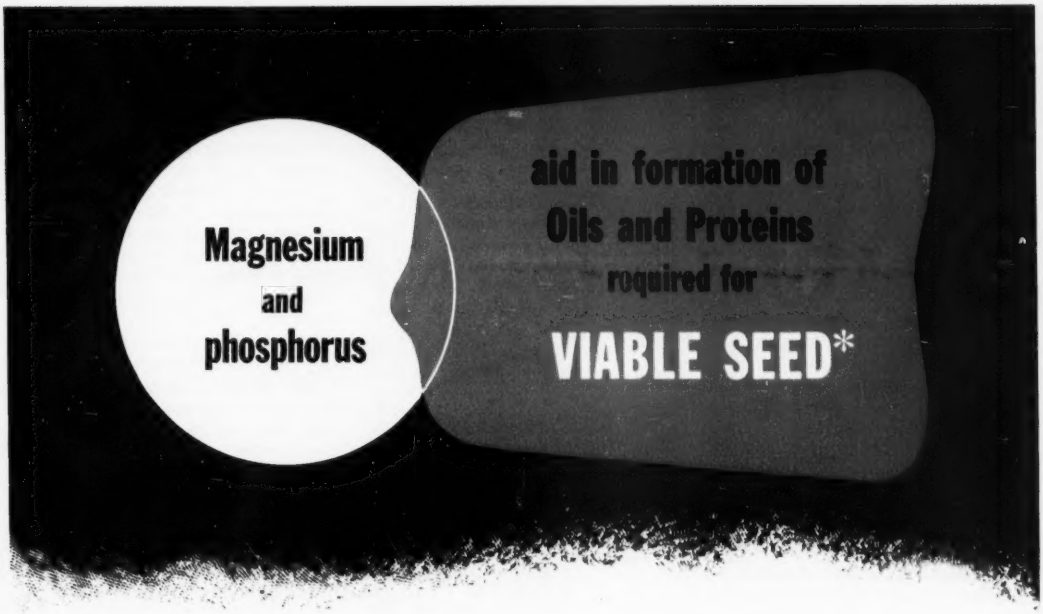
Webster

BULK MATERIALS HANDLING EQUIPMENT

Since 1876 Serving All Industry

MISSISSIPPI

Gulf Improvement Company, has been organized as a subsidiary of **M. T. Reed Construction Co.** and will operate the $20,000,000 nitrophosphate plant Reed is building at Pascagoula. The USDA nitric acid process will be used. The nitric acid unit will produce 235 daily tons; the ammonia output will be 50 daily tons when the plant is complete two years from now.



Include Soluble Magnesium in Your Quality Fertilizers

Sul-Po-Mag®

Water-Soluble
Double Sulfate of Potash-Magnesia

Magnesium is the basic metallic element in chlorophyll, the green plant substance which captures the sun's energy that is vital for life and growth.

* Magnesium concentrates in the seed with phosphorus to aid in the formation of oils and proteins required for viable seed.

Magnesium functions as a carrier of phosphates to the actively growing and fruiting parts of the plant.

Magnesium is required to activate the processes which stimulate the production and transport of carbohydrates and proteins within the growing plant.

Magnesium, in sufficient quantities, enables the plant to utilize other plant nutrients for healthy, disease-resistant growth.

Magnesium stimulates the growth of soil bacteria and increases the nitrogen-fixing power of legumes.

To grow big yields of high-quality seed crops such as corn, small grains, cotton and soybeans, there must be an ample supply of magnesium in the soil. Magnesium plays an especially important part in seed formation. As the plant matures, magnesium concentrates with phosphorus in the seed to produce the proteins and oils that are required for plump, viable seeds. Almost all plants need more magnesium than calcium in their seeds, and often more magnesium than either phosphorus or sulfur. Seeds of an oily nature, soybeans and cottonseed for example, have a particularly high magnesium requirement.

If soils are deficient in this vital plant nutrient, the farmer must supply it in order to get maximum quality and yield. He can do this most efficiently and at less cost by using a fertilizer containing soluble magnesium.

Many manufacturers of quality fertilizers have found that by far the most practical and effective way to supply soluble magnesium is to include *Sul-Po-Mag* in their mixtures for crops grown on magnesium-deficient soils. *Sul-Po-Mag*, produced exclusively by *International*, is a properly balanced source of magnesium and potash, both in sulfate form, water-soluble and immediately available to growing crops. It is supplied for use in mixed fertilizers and also bagged for direct application to the soil.

More and more farmers are asking for fertilizers containing *Sul-Po-Mag*. You'll be doing your customers a real service by using *Sul-Po-Mag* in the complete plant foods you mix for magnesium-deficient soils.

International MINERALS & CHEMICAL CORPORATION

MURIATE OF POTASH
SULFATE OF POTASH
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POTASH DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6

The Mississippi Chemical Corporation, Yazoo City, reported a half million dollar profit for its first year of operation at a meeting held last month.

• • •

Planters Fertilizer Company, Inc. Cary, has been incorporated for $100,000.

MISSOURI

Monsanto Chemical Co., St. Louis, in an effort to clarify the soil conditioner situation, has decided to sell the raw material to compounders, to license them under Monsanto patents, and to give them technical aid. The products will be sold under the formulators' own brand names. Monsanto will continue to sell as it has in the past through distributors and dealers.

• • •

Missouri Farmers Association's plans to build a $3,500,000 fertilizer plant near Joplin are reported under Kansas news because the plant is adjacent to an **Eagle-Picher** plant which will be a major source of sulphuric, and which is just across the state line.

• • •

Thurston Chemical, Joplin, have DPA approval and have let about half the contracts on the four units of their Atlas plant, two of which are expected to be in operation by February.

NEBRASKA

Allied Chemical and Dye's $25,000,000 pelletized urea plant at La Platte will get under construction as soon as the natural gas facilities are assured. As reported here in July, more than half the production will be pelletized out of 110,000 annual tons of production of urea and anhydrous ammonia.

As we go to press we learn that Senator John Sparkman has interested himself in the problem of getting natural gas for the La Platte operation, and conferred with officials there concerning it.

NEW YORK

W. R. Grace & Co. have formed **Grace Chemical Company,** a wholly owned subsidiary. **J. Peter Grace, Jr.** is president of both. For other Grace news see Map, Tennessee, and "Mostly Personal," in this issue.

• • •

International Minerals & Chemical are going to put a million dollars or more into improvements on their potash division's Niagara Falls plant. Vice-president **A. Norman Into** says the replacement of old equipment with more modern will increase production by 25% and quality of product will also rise.

• • •

J. T. Baker Chemical Co. has completed installation of a sulphur recovery unit at its Penn Yan plant. The unit recovers from waste hydrogen sulfide and other gases, and they expect to produce 1,250,000 pounds of sulphur annually.

• • •

Green Thumb Fertilizer Co., Inc. has been incorporated to manufacture and deal in fertilizer with $20,000 capital stock. Incorporators are **Leon Hirsch, Louise Kaye and James F. Doyle,** all listed at 350 Broadway, New York.

• • •

Lesser & Fass, Inc. has been chartered to manufacture fertilizers. Directors: **Lillian S. Enright, William Levin and Abraham M. Sapir** whose address is 437 Fifth Avenue, New York.

• • •

Stern's Miracle-Gro., Inc. has been chartered at Geneva to manufacture fertilizers and insecticides. Directors are **Maria and Otto Stern; Willis K. Brandow.**

OHIO

Nitrogen Division, which had already announced that progress of its methanol plant at South Point would clear for ammonia production the fourth "train" of its four-train plant there, has now announced a $5,000,000 plant at South Point to produce a 12-12-12 fertilizer by a new process developed in their research program by which ground phosphate rock is continuously mixed with nitric acid and a small amount of sulfuric—the resulting material is then reacted with anhydrous ammonia, potash salts are added and the product is granulated. The result will be a saving of 88,000 annual tons of 100% sulphuric acid.

Nitrogen Division feel that commercialization of this and similar processes being worked out by the chemical industry will represent the most important development, technologically, in the fertilizer field since the introduction by them of nitrogen solutions for the ammoniation of superphosphate.

John J. Harte Company, Atlanta, Georgia, have the construction contract and are pushing for completion by the summer of 1953.

• • •

American Bituminus & Asphalt Co., backed by agronomists at Ohio State and the State Highway Dept., are claiming lawn-growing virtues for a technique of spraying hot asphalt on a newly seeded lawn. The asphalt, they report, has been used for several years, in layers about one-sixteenth of an inch, and holds the soil and seed until the grass can take root. Application costs from 5 to 8 cents per square yard.

The black surface is said not only to prevent washing in the heaviest rain, but to hold in heat and moisture while the seed is germinating.

OKLAHOMA

Muskogee Soil Conservation Dist. has four fertilizer spreaders, bought by three Muskogee banks and the Production Credit Association. These are located in four sections of the county and made available to farmers, who rent them as needed. The rent will take care of upkeep and repayment of the purchasers.

TENNESSEE

W. R. Grace & Co., whose plans to build a $20,000,000 urea and anhydrous ammonia plant near Memphis were threatened with neighbor trouble, seem about ready to proceed with the operation. The county planning commission has approved the permit for erection of the plant, over the strong protests of adjacent property owners. Grace are borrowing

$35,000,000 for this and other expansion, on a 30-year maturity at 3 7/8%.

A ground breaking ceremony was set for October 14 to which were invited business and civic leaders of Memphis. President J. Peter Grace, Jr. and other officers of the company were to act as hosts. The plant is now scheduled for completion by the summer of 1954.

* * *

The Chickamauga Fertilizer Works, Chattanooga, was damaged by fire September 27. Conveyor, roof and a freight car on siding were burned. Damage was estimated at $2,000.

TEXAS

Crescent Chemical are building near Houston a plant to produce 825 daily tons of triple superphosphate.

* * *

Plainsman Fertilizer, Inc. has been dissolved as a Texas corporation, and granted a charter in Delaware with a 10-year Texas permit. The home office remains in Plainview.

VIRGINIA

The State of Virginia owns a lime-grinding operation, intended "to get some work out of long-term and desperate criminals, and to encourage the use of agricultural lime." The state auditor pointed out recently that the operation went into the red by $10,580 in the last fiscal year—and the Richmond News Leader, in a bitter editorial demands to know "What in the world is the Commonwealth doing in the lime-grinding business anyhow? How can Virginians consistently oppose special interest subsidies from Washington and sponsor the same things here at home?"

WISCONSIN

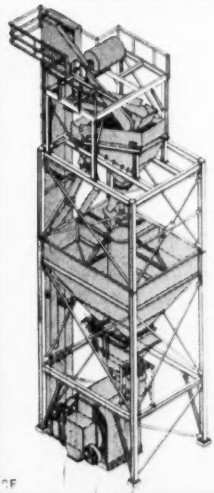
Top Oil & Chemical Co., Milwaukee have recently sponsored a visual demonstration, movie and discussion on Krilium, with a team of **Monsanto** experts conducting the affair.

AFRICA

Werkspoor, a metallurgical concern at Amsterdam, The Nether-

Johnson multiple material weigh-batcher, with 5,000-lb. dial head scale, accurately weighs up to 5 (or more) fine-grained materials. Top levers open fill valves from overhead 5 section bin. Lower lever discharges batch into the mixing unit.

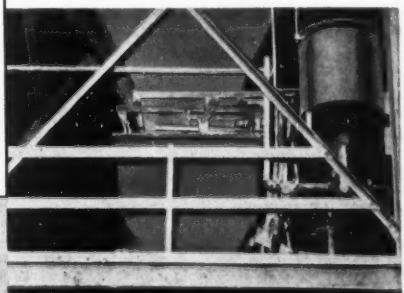
Another
JOHNSON BLENDING PLANT
for midwestern fertilizer manufacturer



TO modernize one of its plants, a leading midwestern fertilizer manufacturer installed Johnson elevator, bin and batching equipment . . . gained a 25% increase in production, and, at the same time, substantially reduced manpower requirements. As a result, the fertilizer firm has equipped another one of its manufacturing plants with Johnson blending equipment, shown here.

Here's how this mechanized handling eliminates slow, costly manual methods: In one continuous cycle of operation, material travels up bucket elevator to clod breaker . . . through separating screen into collecting hopper. From hopper, pulverized fertilizer passes through pivoted distributor into 5-section, 65 cu. yd. bin . . . then, to multiple-material weigh-batcher, and into mixing unit for final blending operation.

To check savings possible in your plants, call your Johnson distributor, or write us.



Side view of bin and dry-material batcher. Solution batch tank adds liquid to mixer, shown at lower left.

C. S. JOHNSON CO. CHAMPAIGN, ILLINOIS
Send us more information on Johnson fertilizer blending plants.
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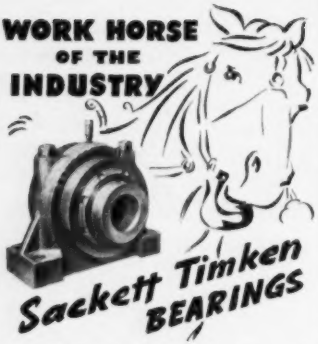


Sackett Timken BEARINGS

Sackett Builds The Equipment You Need

★ ONE MAN BATCH WEIGH SYSTEMS
★ PLANT MODERNIZATION PROGRAMS
★ CONTINUOUS AMMONIATION UNITS
★ MIXING AND SHIPPING EQUIPMENT

Aerating Equipment
Automatic Control Equipment
Basing Units
Belt Conveyors
Bucket Elevators
Centralized Control Systems
Continuous Acidulating Processes
Continuous Ammoniating Systems
Conveyors
Coolers
Crushers
Disintegrators
Dry-Mixing Units
Dust-Arresting Equipment
Fume Scrubbing Systems
Hoppers and Spouts
Materials Handling Equipment
Milling and Screening Units
Multiple Hopper Batching Systems
Oil Fired Dryers
Plant Mechanization Systems
Pneumatically-Operated Gravity Batch Mixers
Pneumatically-Controlled Valves
Pulverizers
Sackett Timken Bearings
Sacking Units
Scales
Screens
Shipping Units
Shuttle Belt Conveying Systems
Tailing Mills
Vacuum Condensing Systems

GET THE RIGHT ANSWER TO YOUR PRODUCTION PROBLEMS get Sackett

SACKETT

THE A. J. SACKETT & SONS CO.
1727 S. HIGHLAND AVENUE
BALTIMORE 24, MARYLAND

lands, will build at Moderfontein, South Africa a nitrogenous fertilizer plant from an affiliate of the **De-Beers** interests. The plant is due to be completed by mid-1954 with an initial capacity of 20 daily tons, to be doubled eventually.

AUSTRALIA

Cresco Fertilizers, Ltd. have begun construction of a two million pound sulphuric acid plant at Port Adelaide. When it is completed toward the end of 1954, operation will be taken over by **Sulfuric Acid Ltd.**, in which Cresco has an interest. The plant is slated to produce about 100,000 annual tons.

* * *

Electrolytic Zinc of Australia, Ltd. are building a plant near Risdon, Tasmania, to produce 100,000 annual tons of sulfuric acid, and 55,000 tons of ammonium sulfate.

CANADA

A plant has recently begun operations at Prince Rupert, producing liquid fertilizer from fish waste, which has been tested on northern British Columbia farms. The report is that one farmer who sprayed his field produced a five-pound head of lettuce!

* * *

Canadian Salt Company plans to erect a plant to produce about 20 tons of chlorine and 24 tons of caustic soda daily through electrical separation of the elements in salt. Across the line near Unity, Saskatchewan, another drilling crew didn't find any oil either, but did locate a potash bed which is estimated to contain five billion tons. This week, Western Potash Corporation is going to start sinking a shaft to the bed to mine it.

"We are aiming at production of 1,000 tons a day by late 1954," says **J. O. G. Sanderson,** president. This would be enough to supply the entire Canadian market and leave some for export he claims. "An American firm wants to take our entire exportable surplus, while a New Zealand firm has offered to take 150,000 tons a year," he adds.

ICELAND

Iceland is building a $7,000,000 ammonium nitrate plant which will supply their total needs. The World Bank and MSA supplied the money.

INDIA

Uttar Pradesh, the most populous state in the Indian Union has taken over 60,000,000 acres previously owned by 2,200,000 landlords in an effort "to give dignity and status to the peasant". Tenants will pay rent to the state now instead of to the landlords. Sub-tenants will continue in possession regardless of the terms of their tenure, but must acquire what is known as "Bhumidari Rights" which means they must put in the government treasury ten times the existing rent of the land, within five years, or ten if they can't make it then.

If they cannot do that, they are mere "Asami" which makes them mere hired help, and which sounds as though they were back to the class of Peasant-without-Dignity.

This operation is known as "Democratic Reform" and has a very familiar ring to it. It is also called a "Peaceful Revolution".

JAPAN

Production of nitrogenous fertilizer exceeded the target total of 2,290,000 metric tons during the 1951-52 season reaching an actual total of 2,318,000 metric tons, including 1,760,000 tons of ammonium sulphate, according to Japan's Ministry of International Trade and Industry. Exports, to Korea, Formosa, Okinawa, Philippines, India and Australia, totalled 181,286 tons.

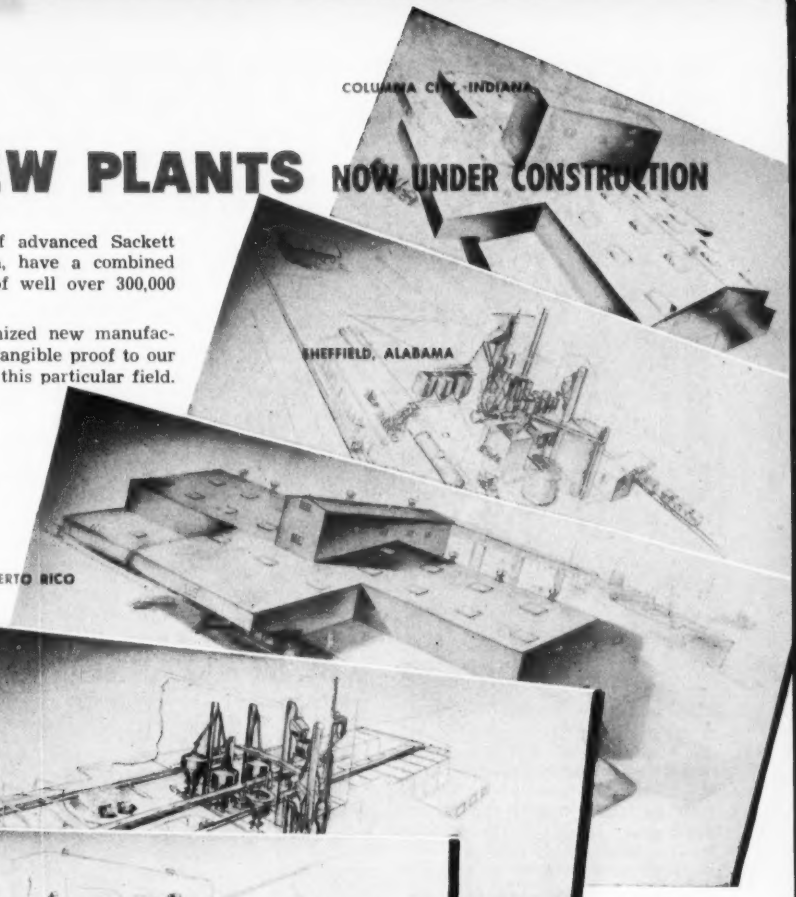
Targets for the present season have been set at 2,400,000 tons of nitrogenous and 1,500,000 tons of phosphate fertilizer. Export targets are for 550,000 tons of nitrogenous; 100,000 tons of phosphate fertilizer. Output is good, but sales are not, according to the report, so exports are being pushed with vigor. The Korean item below may suggest some slight stumbling blocks which may develop in this program.

6 NEW PLANTS NOW UNDER CONSTRUCTION

These brilliant performers of advanced Sackett design will, upon completion, have a combined annual production capacity of well over 300,000 tons.

Each of these highly mechanized new manufacturing facilities adds further tangible proof to our long-recognized leadership in this particular field.

Superphosphate and mixed goods producers are invited to get our seasoned counsel on their expansion and modernization programs. It is available at no cost.



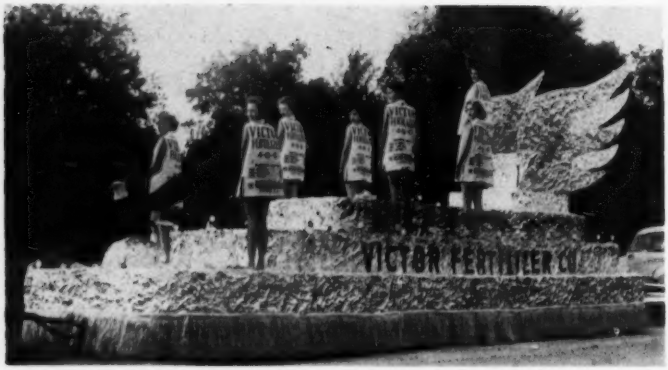
SACKETT BALTIMORE

America's Foremost Designers and Builders

SUPERPHOSPHATE PLANTS • FERTILIZER MIXING PLANTS • RELATED PRODUCTION EQUIPMENT

THE A. J. SACKETT & SONS CO., 1727 S. HIGHLAND AVENUE, BALTIMORE 24, MD.

Architects and Manufacturing Engineers to the Fertilizer Industry since 1897



Victor Fertilizer Company, Chester, S. C. won first prize with this float in the Chester County Guernsey Festival. Note the fertilizer bags made into beach coats—which have now become a teen-age fad in their selection.

KOREA

A **United Nations** team is making a study and is expected to report the advisability of constructing fertilizer capacity in South Korea which would not only supply the needs of the land, but put Korea into the field of export to the Asiatic market. Korea now imports an annual half million tons of fertilizer and consumption should build up to around a million tons.

MEXICO

Gulf Sulphur has found more than 276 feet of commercial sulphur-bearing layers in the Mexican holdings at Tehautepec, and the end is not yet. They compare it with the best sulphur producing areas anywhere in the world. They plan to sell 225,000 shares of stock to finance these explorations.

• • •

Mexican Government's Bureau of Conservation has begun a campaign to educate Mexican farmers to make their own fertilizer from farm wastes —straw, wild grass, nopal leaves by a process developed by **Dr. Francisco Chavez Galvez** which requires the use of "Huma-hormona"—a formula of mineral salts, bacteria and nitrates — which will be given the farmers free by the government.

It is hoped this technique will bring final success to many years of effort to teach the little farmers the value of plant food as a way of increasing yields, which has been blocked by the almost total inability of the small land-holder to purchase any form of fertilizer.

New Booklet Describes Bamag Electrolyser

General Industrial Development Corporation exclusive agent in the U. S. and Canada for Bamag-Meguin, has available for distribution an 8-page bulletin on Bamag pressure bipolar type electrolytic cells for the manufacture of pure hydrogen and oxygen. The bulletin discusses in detail the operation of the electrolyser. Several illustrations, a lay-out of a typical installation, a schematic drawing, performance curves and complete technical data make up the contents of this factual booklet. The Bamag electrolyser is characterized by high efficiency, automatic operation and long life. The bulletin is available from General Industrial Development Corp., 270 Park Avenue, New York 17, N. Y.

Shell Offers CBP-55 Fumigant

A New Soil Fumigant—CBP-55—a Shell product which will soon be in commercial production and is now available in pilot plant quantities, has demonstrated its effectiveness in control of soil pathogens in tobacco seed beds and nursery stock and for control of root rots of strawberries. Heretofore, partial sterilization of the soil has been accomplished by steaming, by formalde-hyde drenches or with heavy applications of soil fumigants such as chloropicrin or carbon bisulfide. The cost of these treatments is in the range of $400-$1000 per acre which precludes their use for any but greenhouse soils or seed beds where very high value crops are grown. For the first time with advent of CBP-55 a practical and relatively inexpensive means of soil fungus control is available for field grown crops.

Systemic Insecticides In Pink Bollworm Control

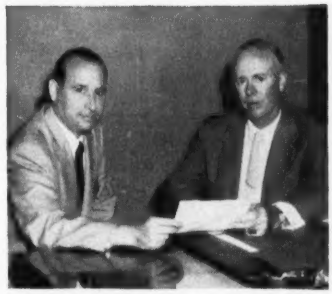
Whether or not systemic insecticides can be used to control the pink bollworm, a serious cotton insect pest, is the question that entomologists of the U. S. Department of Agriculture and the Texas Agricultural Experiment Station are now trying to answer, working at the Brownsville, Texas laboratory of USDA's Bureau of Entomology and Plant Quarantine. The cooperating scientists are testing hundreds of chemical compounds to determine their possible use as systemic insecticides. Specifically they are seeking insecticides that can be absorbed by cotton plants so that pink bollworms developing inside the green cotton bolls will be killed.

Evidence from tests thus far indicate that systemics used as foliage sprays show greater promise than those used a dust or as soil treatments. Of the 12 systemic compounds that killed pink bollworms, six required only four parts of insecticide in a million parts of green cotton boll for effective results. Three others were effective when used at the rate of 16 parts per million, and the remaining three when used at the rate of 64 parts per million.

HUDSON ENLARGES GUARANTEE ON MULTIWALL SACKS: NOW COVERS DAMAGE ON PACKER

Will replace without cost any Hudson Multiwall Sack broken on packing or closing machines

NEW YORK CITY. The Hudson Pulp & Paper Corp. has announced the terms of an unusual new guarantee to purchasers of Multiwall Sacks. In the first such guarantee in Multiwall Sack history, the company binds itself to replace any Hudson Multiwall Sack which bursts, tears, splits, or otherwise fails in the course of packing or closing. Hudson emphasizes that this new guarantee is in addition to their usual warranties of quality and workmanship implicit in every contract.



T. H. Mittendorf (right), Hudson Vice President in Charge of Sales, and J. B. Mendelsohn, Multiwall Sack Sales Manager, look over the first printed copy of the company's unusual guarantee on Multiwall Sacks.

A typical scene showing Multiwall Sacks being filled and closed. Now, for the first time, a Multiwall Sack manufacturer is guaranteeing to replace any sacks broken during such operations.

World's most fully guaranteed Multiwall Sack

Hudson has such faith in the quality of its Multiwall Sacks that it gives the world's fullest guarantee on their performance. While other companies warrant their sacks only against abnormal breakage, Hudson guarantees that *all* its sacks must successfully pass *all* filling and closing operations, or be replaced without further cost.

Multiwall Sack Users urged to investigate this offer

The new Hudson guarantee plan went into effect with all sacks purchased on or after Sept. 15, 1952. Multiwall Sack buyers who have learned of this new plan have hailed it as one of the most important developments in years.

Full information regarding the scope and benefits of the guarantee is being sent, without obligation, to all Multiwall Sack buyers who request it.

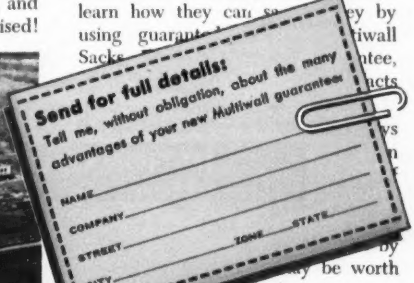
Integrated Hudson mill assures delivery

Hudson Multiwall Sack contracts are backed up by a fully integrated new mill at Palatka, Florida. Because every step of manufacture is under one control, Hudson is certain all sacks are made to your exact specifications, and are shipped when they are promised!

Though Hudson's Palatka mill is new, Hudson has 42 years of paper making experience.

Urge Multiwall Sack users to write for facts

The Hudson Pulp & Paper Corp. invites all users of Multiwall Sacks to learn how they can sa[illegible]ey by using guara[illegible]tiwall Sacks [illegible]ntee, [illegible]acts [illegible]ys [illegible]n [illegible] by [illegible] be worth



Hudson Pulp & Paper Corp.
Dept. 151, 505 Park Ave., New York 22, N.Y.

SUCCESS OF RADIOACTIVE PHOSPHORUS COMMITTEE LEADS TO DISBANDING

Dr. Vincent Sauchelli reports that the research program of the Industry Committee on Radioactive and Tagged Element Research is going so well that support by the committee no longer seems essential. Hence, the Committee is being discontinued. Dr. Sauchelli points out that the work of this Committee indicates how, through timely grants, the industry may stimulate important programs.

Full credit should be given the following men, who have served on this committee. Since its formation in 1946, the following industry representatives have served:

M. V. Bailey, American Cyanamid Co.; F. E. Boyd, Virginia-Carolina Chemical Co.; F. O. Case, Anaconda Copper Mining Co.; J. A. Chucka, Eastern States Farmers' Exchange; F. W. Darner, U. S. Phosphoric Products; D. S. Fink, American Cyanamid Co.; H. E. Hendricks, Knoxville Fertilizer Co.; R. R. Hull, I. P. Thomas & Sons Co.; D. D. Long, International Minerals & Chemical Corp.; H. B. Siems, Swift & Co.; J. E. Totman, Northern Chemical Industries, Inc.; Vincent Sauchelli, Davison Chemical Corporation, Chairman.

Following is a full statement of the funds which have been contributed by the industry, and their disbursement. The balance on hand is being reserved for projects and travel expenses of research men attending regional meetings concerned exclusively with such radioactive phosphorus projects as are not yet completed.

FINAL FINANCIAL REPORT

DISBURSEMENTS

Agricultural Experiment Station	1946-47	1947-48	1949-50	1950-51	1951-52
Michigan				$ 3,500.00	
Arizona			$ 1,500.00		
Colorado		$ 2,500.00	2,000.00	500.00	$2,100.00
Georgia			2,500.00	500.00	1,500.00
Idaho			1,500.00		
Indiana (Purdue)				500.00	
Iowa		2,500.00	5,000.00		2,000.00
Maine			3,000.00	2,000.00	500.00
Mississippi				500.00	700.00
New Hampshire				2,000.00	1,000.00
New York (Cornell)		2,500.00	2,000.00		
North Carolina	$12,445.50	12,000.00	2,500.00	1,500.00	1,500.00
Utah				3,500.00	
Virginia				3,000.00	
Addison Letter Service[1]	4.50				
American Potash Institute[2]		24.28			
College Supply Store[3]		12.00			
Williams & Wilkins[4]			245.00		
Business Press, Inc.[5]			23.12		
Travel Expense[6]					36.30
Travel Expense[7]					275.26
Totals	$12,450.00	$19,536.28	$20,268.12	$17,500.00	$9,611.56

(1) 100 mimeographed letters.
(2) 1,000 reprints of "Radioisotopes" for general distribution.
(3) 12 copies of "Conference on Radioactive Isotopes" for distribution to Committee members.
(4) 350 copies of SOIL SCIENCE for general distribution.
(5) 200 reprints of "Phosphorus in Soils & Fertilizers" for general distribution.
(6) N. S. Hall, Univ. of N. C. to Washington, D. C.
(7) H. B. Peterson, Utah State Agric. College to Washington, D. C.

TOTAL RECEIPTS	$84,600.00
TOTAL DISBURSEMENTS	79,365.96
Balance on Hand	$ 5,234.04

July 1, 1952
Baltimore, Maryland

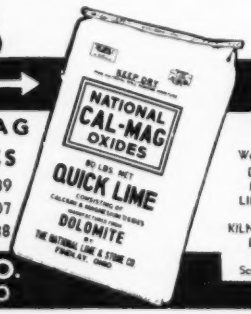
V. Sauchelli, Chairman
Industry Committee on Radioactive and Tagged Element Research

CAL-MAG OXIDES
CUT YOUR COSTS WITH

Unexcelled for its superior Dehydrating, Neutralizing, and Curing factors in the preparation of better fertilizers. Write for complete information.

PROMPT SHIPMENTS
Three railroads serve our Carey, Ohio plant--assuring prompt delivery--everywhere.

CAL-MAG OXIDES
MgO 40.39
CaO 58.07
TNP 203.88



We Also Produce
DOLOMITIC HYDRATED LIME (165 TNP)
and
KILN DRIED RAW DOLOMITE (107 TNP)
Screened to size

The NATIONAL LIME and STONE CO.
General Offices • • • • • FINDLAY, OHIO

More N Per Dollar!

PHILLIPS 66 NITROGEN SOLUTIONS are shipped in aluminum tank cars like the one shown here. To you this means a better product . . . no corrosion . . . more N per dollar!

There are three Phillips *66* Nitrogen Solutions for use in preparation of high-analysis fertilizers and the ammoniation of superphosphate. These solutions keep handling costs low . . . promote rapid, thorough curing.

The need for nitrogen is great. Even Phillips tremendous capacity isn't equal to today's demands. But we're making four different kinds of high-quality nitrogen materials in an effort to meet the needs of mixers and farmers.

1. AMMONIUM SULFATE . . . Phillips *66* Ammonium Sulfate contains 21% N. Flows freely, resists caking.

2. AMMONIUM NITRATE . . . Phillips *66* Ammonium Nitrate contains 33% N. Small, coated, uniform pellets flow freely and resist caking.

3. ANHYDROUS AMMONIA . . . Phillips *66* Agricultural Ammonia contains 82% N. Convenient, economical source of nitrogen for fertilizers.

4. NITROGEN SOLUTIONS (see description above.)

For full information write our nearest district office.

Phillips 66

PHILLIPS CHEMICAL COMPANY

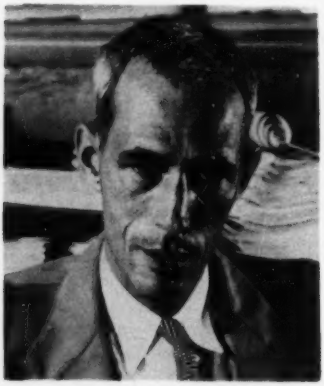
A Subsidiary of Phillips Petroleum Company

FERTILIZER SALES DIVISION · BARTLESVILLE, OKLAHOMA

DISTRICT SALES OFFICES:

NORFOLK—610 Royster Bldg. · TAMPA—7 Terrace Office Bldg., 404 Marion St. · HOUSTON—604 City National Bank Bldg.
OMAHA—WOW Bldg. · AMARILLO—First National Bank Bldg. PASADENA—16 North Marengo Ave. · BARTLESVILLE—Adams Bldg.

Above, Dr. Christian V. Holland, named director of chemical research for Spencer Chemical Company. Below, James E. Cadle, who has been made sales manager of The Baughman Manufacturing Company. A former flyer he will cover the nation in one of the Company's Cessna ships. F. Michael Hanlon, not shown, has become manager of the Baughman Western division.



Mostly Personal

Jim Totman came back from France with his family September 22 to find he was reelected a Representative to the Legislature of the State of Maine. His term as Mayor of Bangor expires December 31. Jim is assistant treasurer of **Summers Fertilizer.**

* * *

Grace Chemical Company (see Map, New York) will have among its directors **Charles E. Wilson,** former General Electric President and first chairman of Defense Mobilization; **Robert T. Haslam,** former vice-president and board member of Standard Oil of New Jersey, president of U. S. Pipe Line Company; **Bradley Dewey,** president of Dewey and Almy Chemical Company and wartime US Rubber director; Professor **Edwin R. Gilliland,** M.I.T. Dean of engineering.

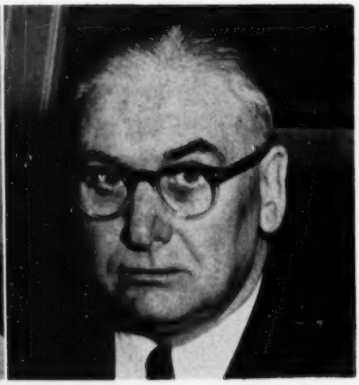
John Carriere, now manager of engineering and construction for the Atomic Energy Commission's Hanford works, has been appointed plant manager by **J. Peter Grace, Jr.** president of W. R. Grace & Co., and the new wholly owned chemical subsidiary.

Dr. Allen Cole, Davison Chemical's manager at Bartow, Florida, recently made a talk on phosphate to the Kiwanians of that city. He told of its economic importance and future.

* * *

Dave Long, who won the first Distinguished Service Award ever made by NFA's plant food research committee, was not present last June at the NFA convention, and it was given him in absentia. But the officers of **International Minerals & Chemical** felt the presentation should be made in person, and recently held a luncheon for the purpose. In a letter to the committee, Dave wrote:

"Thanks to all of you whose names appear upon the award and to all who contributed to the much appreciated expression of my association with this group of workers. Upon the receipt of this Award a flood of pleasant recollections of the activities of the Plant Food Research Committee passed through my mind. First, was the associates, many of whom either now or in the past were regarded as the outstand-



Dr. Wayne T. Barrett, left, has been made manager of the research department of the Davison Chemical research and development division. Center, George Klein, Nashville district manager. Right Bernard C. Manker, Lansing district manager for Davison's Mixed Fertilizer Division. The two latter posts are newly created as part of a change in the organization of the fertilizer operation.

ing men in their fields and who today I hold as a pleasure and privilege in knowing. Secondly, I recollect with pleasure the imaginative scope of inquiry developed from our deliberations and the influence of these upon the research of the Agricultural Colleges and Experiment Stations. Thirdly, the change of attitude of the College and Experiment Station workers toward the fertilizer industry during my time has been one of our greatest attainments. From aloofness, in many instances severe, we today enjoy the highest type of cooperation and confidence."

• • •

J. A. "Doc" White has been appointed to supervise sales for **Chase Bag,** operating from the new sales office at 6009 W. Broad Street, Richmond, Virginia. He has had more than 20 years in the bag business, most of it in the Virginia-Carolina area he will serve.

• • •

D. H. Kennedy has been made Western salesmanger for **International Paper,** Southern Kraft Division, succeeding the late **Raymond Bee.** He joined them in 1926. **J. D. Dooley** and **N. P. Sparkman** are his assistants, on kraft linerboard and paper and bag sales respectively.

• • •

Managerial appointments at two branch sales offices of **Diamond Alkali Company** were announced by **W. H. McConnell,** the company's Director of Sales.

Effective November 1, **Earl J. Mills** will become manager of the Chicago branch sales office, succeeding the late **Charles W. Klaus,** and **John W. Kennady** will be manager of the Southwest District sales office, which has its headquarters at Houston, Texas.

The Chicago office supervises Diamond sales activities in a nine-state area comprising Illinois, Indiana, Iowa, Michigan, Minnesota, Wisconsin, Nebraska, and the Dakotas. The Southwest District embraces the states of Texas, Oklahoma, and Kansas.

The move will return to Chicago a sales executive well-known in that area. From 1945 until 1949, Mr. Mills was manager of less-carload sales for Diamond at its Chicago office. He joined them in 1932.

Mr. Mills, who is 51, is a veteran member of Diamond's Sales Department. Throughout his many years with the company in sales, service, and supervisory capacities, he has covered the country extensively and has built up a wide acquaintanceship in the chemical and allied fields.

Mr. Kennady, is 42. He comes to the Diamond sales organization from Kolker Chemical Works, Inc., a Dia-

Above G. W. Huldrum, Jr. Eastern Division Sales manager, and below V. C. Irvine, Western Division Sales manager for Shell Chemical Corporation. A. J. Garon, not shown, has been made Manager of the Houston are for the Julius Hyman & Co. Division of Shell.

Enlargement of the traffic department of Commercial Solvents has brought these changes: O. L. Culbreth, left, will be in charge operating from New York office, assisted by R. F. Archer, not shown. T. G. Preston, center, will be manager of the Marine Division. E. P. McCullough, right, is assistant general traffic manager, operating from Terre Haute.

It's incredible!
...the commodities
that go into a
BAGPAK
bag

Polystyrene—Feeds—Calcium Chloride—Salt—Ammonium Nitrate—Cement—Rosin—Fertilizers—Sugar—Flour—Insecticides—Fine Chemicals—Clays—Rock Wool—and over 400 other products costing from less than a cent a pound to over a dollar a pound are being packed in Bagpak Multiwall Paper Bags.

Bagpak uses formerly Bag Closing Machines. For details about bags and machines write to Bagpak Division, International Paper Company, 220 East 42nd St., New York 17, Dept. C-7

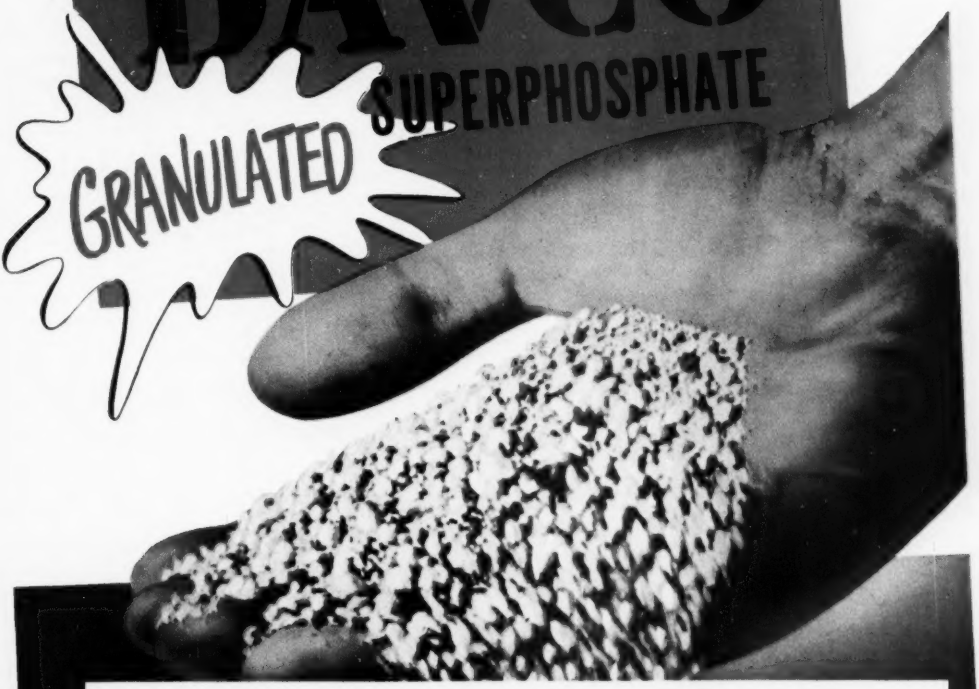
International Paper COMPANY

BAGPAK DIVISION

BRANCH OFFICES: Atlanta • Baltimore • Baxter Springs, Kansas • Boston Chicago • Cleveland • Denver • Detroit • Kansas City, Kansas • Los Angeles New Orleans • Philadelphia • Pittsburgh • St. Louis • San Francisco • IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

DAVCO*

GRANULATED SUPERPHOSPHATE



OFFERS YOU 3-WAY CONTROL

- **STORAGE CONTROL—** No caking or lumping while in storage.
- **APPLICATION CONTROL—** No dusting or bridging; drills free and even.
- **FOOD CONTROL—** Supplies plant food at a uniform rate.

You can actually see and feel the difference in DAVCO Granulated Superphosphate. You and your customers can tell why Granulated Superphosphate will not cake no matter how long it is kept in storage. And you can see the reasons for its ease in drilling . . . the fact that it will not dust nor bridge over. Granulated Superphosphate drills freely and evenly in the field giving complete coverage. And because of the granular structure, plant food is released at desirable rates.

DAVCO GRANULATED SUPERPHOSPHATE gives the added points which can make a sale and in turn will keep that customer sold. Order your superphosphate now, but be sure it is DAVCO GRANULATED SUPERPHOSPHATE WITH THE 3-WAY CONTROL.

*Reg. T. M.

Progress through Chemistry

THE DAVISON CHEMICAL CORPORATION

Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO GRANULATED FERTILIZERS.

mond subsidiary, which he has been serving as district manager at Kolker's Houston plant.

• • •

Emerson M. Jones, Jr. and John C. Docter have been given new sales posts with **Nitrogen Division.**

Mr. Jones has been made Nitrogen Division's field representative for fertilizer manufacture materials to cover Indiana, Illinois, Missouri, and Western Kentucky.

He succeeds J. C. Docter who has been appointed field representative for direct application materials in the same territory.

Prior to joining the Nitrogen Division, Mr. Jones was with the Smith Agricultural Chemical Company.

Mr. Docter joined the Barrett Division in August, 1949.

Theodore E. Detcher has been made assistant sales manager for industrial nitrogen chemicals. His headquarters will be in the New York office.

Mr. Detcher, joined the Barrett Division in October, 1949.

The new assistant to the assistant director of sales at the New York office is **Walter A. Fornoff.** Mr. Fornoff came with Barrett in May, 1942; he was with Sulphate of Ammonia Sales. Prior to his new appointment, he was section supervisor for direct application materials.

Succeeding Mr. Fornoff as section supervisor for direct application materials is **George A. Kalteisen, Jr.** Mr. Kalteisen was formerly section supervisor for fertilizer manufacture materials. He has been with Barrett since May, 1940.

• • •

James M. Gager, Jr., has joined the field sales staff of **Kraft Bag Corp.,** New York City, the firm has announced. He will cover Tennessee, Georgia, South Carolina, and a portion of North Carolina. Mr. Gager will headquarter at Chattanooga, Tenn.

• • •

H. J. Brownlee, Production Manager of **Quaker Oats Limited,** Southall, England, has been named Managing Director. He fills the vacancy left by the death of **William H. White.**

Mr. Brownlee was one of the pioneers in the commercial development of furfural—an industrial chemical made from corn cobs. He joined The Quaker Oats Company in 1920.

• • •

Horace M. Albright, president of **U. S. Potash,** and **T. M. Ware,** chief engineer of **International Minerals and Chemical** were among the leaders on the program of the American Mining Congress, which held 4 days of deliberations late last month in Denver, where the Congress was founded 50 years ago.

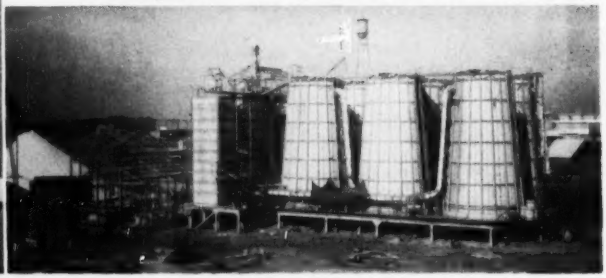
OBITUARIES

Edward J. Koos, president The N. S. Koos & Son Company, September 10 in Kenosha, Wisconsin.

Isaac Taylor Rhea, 75, president Mente & Co., Inc., New Orleans, and his wife, who had been a vice-president and director for many years died within a few weeks of one another, in Memphis, Tennessee, where they have made their home for the past three years.

Ritchie P. Taylor, 49, for 27 years with Davison Chemical, died September 8 in Baltimore.

. . . We Contract For Lead Installation From One Chamber To Complete Chamber Plants



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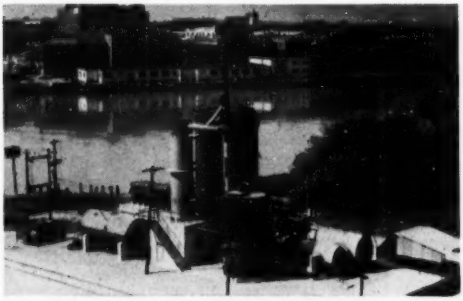

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MARKETS

1951-52 Tag Sales Set Record

Fertilizer tax tag sales and reports of fertilizer shipments in the 15 States currently reporting these statistics reached a new high in the fertilizer year ending June 30, 1952, according to The National Fertilizer Association, Washington, D. C.

Reports of shipments and tag sales from 11 southern States, 3 mid-western States and California indicate that the equivalent of 12.7 million tons of fertilizer were sold in these States during the 12 months ending June 30, 1952. This is a 5.5 percent increase over the equivalent 12.0 million tons sold during the preceding like period.

Superphosphate Production Up

In June, 1952, 208 superphosphate manufacturers made the equivalent of 940,000 tons of 20% A. P. A. basis superphosphate. This was 68,000 tons more than were made during the same month a year ago but 143,000 tons less than May production due to the usual seasonal decline, according to a compilation of reports furnished The National Fertilizer Association, Washington, D. C.

Triple superphosphate production, 45% A. P. A. basis, amounted to 70,000 tons last June, a 29.6 percent increase over June, 1951, output of 54,000 tons.

ORGANICS: The fertilizer organic market is relatively quiet with limited sales of Nitrogenous Tankage being made in the last week for prompt shipment. Domestic productions of Nitrogenous Tankage continue in a heavily sold position at prices ranging from $4.60 to $5.00 per unit of Ammonia, bulk, f. o. b. shipping point. Imported Nitrogenous is offered in limited quantity at around $6.00 to $6.10 per unit of Ammonia bagged, CIF usual Atlantic ports.

CASTOR POMACE: One of the major Eastern producers is in a sold up position for the balance of 1952 but limited supplies are available from another domestic source at $37.25 per ton in burlap bags/paper bags, seller's option, f.o.b. Northeastern production point. Price is $2.00 per ton less if shipment is in 100 lb. paper bags. Imported material is occasionally offered at prices ranging from $40.00 to $45.00 CIF Atlantic ports.

DRIED BLOOD: The Chicago market is off somewhat on dried unground Blood, in bulk, at around $7.50 to $8.00 per unit of Ammonia f.o.b. Chicago area. The New York market is at a level of around $8.00.

POTASH: All producers, except one in Carlsbad, are now pricing 60% Muriate at 43¢ per unit K_2O, bulk f.o.b. Carlsbad and the producer in Trona, effective September 15th, will equalize with that price. Imported material varies in price at United States ports from the same price at which domestic delivers down to a cent or two under the Carlsbad delivered price. Movement is steady and demand good.

GROUND COTTON BUR ASH: This excellent source of Potash, primarily in the form of Carbonate of Potash, testing 38-42% K_2O, continues available for prompt and future shipment at prices approximating the delivered cost of Domestic Sulphate of Potash.

PHOSPHATE ROCK: Domestic movements continue steady to acidulators and no large stocks are reported at the moment. Price situation continues firm.

SUPERPHOSPHATE: Demand for Superphosphate, particularly Triple Superphosphate, is excessive relative to supply; and demand for normal Superphosphate excellent, maintaining the market in a relatively tight position.

FERTILIZER TAX TAG SALES AND REPORTED SHIPMENTS
(In Thousands of Equivalent Short Tons)
Compiled by The National Fertilizer Association

STATE	July 1952	July 1951	June 1952	June 1951	Jan.-June 1952	Jan.-June 1951	Apr.-May-June 1952	Apr.-May-June 1951	July-June 1951-52	July-June 1950-51
Virginia					653	600	331	288	856	759
N. Carolina			63	42	1,584	1,447	691	515	1,901	1,839
S. Carolina	10	8	17	9	743	679	200	152	1,002	988
Georgia	30	11	98	29	1,102	1,018	694	295	1,354	1,298
Florida	59	53	67	76	666	655	134	281	1,217	1,182
Alabama	50	35	40	110	874	863	358	477	1,101	1,090
Tennessee	16	32	74	81	450	391	310	257	657	511
Arkansas	18	9	34	36	294	351	196	216	358	427
Louisiana	8	9	17	13	241	235	101	86	309	309
Texas	20	13	29	23	378	346	139	130	600	602
Oklahoma			5	4	110	89	48	31	235	144
TOTAL SOUTH	211	170	444	423	7,095	6,674	3,202	2,728	9,590	9,149
Indiana	95	75	60	36	553	452	202	177	1,037	948
Kentucky	1/		8	15	372	350	126	118	574	558
Missouri	65	33	18	35	474	447	201	162	764	685
TOTAL MIDWEST	160	108	86	86	1,399	1,249	529	457	2,375	2,191
California					433	401	229	213	764	720
TOTAL OTHER					433	401	229	213	764	720
GRAND TOTAL	371	278	530	509	8,927	8,324	3,960	3,398	12,729	12,060

1/ Beginning July 1, 1952, Kentucky will report fertilizer shipments and tax tag sales semiannually.

U. S. SUPERPHOSPHATE SUMMARIES, in Thousands of Short Tons
Based on Data for 208 Plants, Representing Total U. S. Production
Compiled from Reports Submitted to The National Fertilizer Association and a Summary of Reports Submitted to the Bureau of the Census

	June			Total, 18% APA Basis				Conc. (45% APA)	
	Normal 18% APA Basis	Wet Base 18% APA Basis	Conc. 45% APA Basis	June 1952	June 1951	Jan.-June 1952	Jan.-June 1951	Jan.-June 1951	Jan.-June 1952
Stocks, first of period	826	2	76	1,018	919	1,252	1,207	66	55
Production	760	5	70	940	872	6 253	6,017	415	367
Received from other plants	11			11	15	121	78		
Book Adjustments	12			11	14	35	7		
Total Supply	1,609	7	146	1,980	1,820	7,661	7,309	481	422
Shipments	299	1	59	448	456	3,577	3,584	391	354
Used in reporting plants	300	1	1	302	272	2,854	2,633	4	5
Total disposit'n	599	2	60	750	728	6,431	6,217	395	359
Stocks, end of period	1,010	5	86	1,230	1,092	1,230	1,092	86	63

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In the Field of

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NAC CONVENTION REPORT

A big attendance marked the nineteenth annual meeting of the National Agricultural Chemicals Association, September 3-5, at Spring Lake, New Jersey. All officers were re-elected, as follows:

As president, Arthur W. Mohr, president of The California Spray-Chemical Corp., Richmond, California; as vice-president, Paul Mayfield, general manager of the Naval Stores Dept., Hercules Powder Co., Inc., Wilmington, Delaware; and as Executive Secretary, Lea S. Hitchner, Washington, D. C.

Those elected to the NAC Association board of directors for terms of one to five years are as follows:

W. W. Allen, Mgr., Agricultural Chem. Sales, The Dow Chemical Company, Midland, Michigan.

W. C. Bennett, Pres., Phelps Dodge Refining Corp., New York, N. Y.

J. Hallam Boyd, Exec. Vice-Pres., Commercial Chemical Co., Memphis, Tennessee.

F. W. Hatch, Vice-Pres. and Manager, Julius Hyman Div., Shell Chemical Corp., New York, N. Y.

John Paul Jones, Asst. to Gen. Mgr., Stauffer Chem. Co., New York, N. Y.

G. F. Leonard, Exec. Vice-Pres., Tobacco By-Prod. & Chem. Corp., Richmond, Virginia.

Paul Mayfield, Gen. Mgr., Naval Stores Dept., Hercules Powder Co., Inc., Wilmington, Delaware.

James McConnon, Vice-Pres., McConnon & Company, Winona, Minnesota.

A. W. Mohr, Pres., California Spray-Chemical Corp., Richmond, Calif.

August Petrus, President, Cotton States Chemical Company., Inc. West Monroe, La.

E. H. Phillips, Dir. of Purchasing, GLF Soil Bldg. Service, Div. of Coop., GLF Exchange, Inc., New York, N. Y.

Fred Shannaman, Pres., Pennsylvania Salt Mfg. Co. of Wash., Tacoma, Wash.

Russell B. Stoddard, Coor. of Insecticide Operations, U. S. Industrial Chemicals Co., Div. of National Distillers Prod. Corp., New York, N. Y.

Byron P. Webster, Vice-Pres., Chipman Chemical Co., Inc., Bound Brook, N. J.

J. M. Taylor, Pres., Taylor Chemical Co., Aberdeen, N. C.

The immediate past president, Ernest Hart, vice-president of the Food Machinery and Chemical Corporation, San Jose, Calif., and Lea S. Hitchner, are ex-officio members of the board of directors.

President Mohr pointed out in his opening address that a complete reversal had taken place since the last meeting, at which time materials were scarce, and the efforts of the association now are in the direction of increasing export quotas.

Dr. Clair R. Spealman, CAA, spoke on the medical aspects of airplane dusting and spraying, covering the medical aspect of the pilots chosen, their safety from the chemicals they use and the safety of humans and animals in areas being dusted.

W. A. Minor, Assistant to the Secretary, USDA, spoke on the need for food for the "fifth plate" and the part agricultural chemicals can play in that program.

Dr. G. D. Humphrey, President University of Wyoming, issued a warning that industry may be short 13,800 scientists by 1954 because enrollment in science courses is falling off rapidly, and advocated business subsidies, so as to avoid Government subsidies of education, which would change the whole philosophy of American life.

Dr. Paul Sanders, Editor, Southern Planter's talk on Agriculture's Role in the American Story is offered complete in this issue, as are the talks of Dr. H. H. Shepard and Oris V. Wells, both of USDA.

Walter W. Dykstra, Department of the Interior discussed control programs in terms of wild life, fish and the control of rodents.

Gene Flack, Sunshine Biscuits, made one of his inimitable and unusual talks on merchandising.

The final day was led off by Lee S. Hitchner, making an annual Executive Secretary report.

Avery S. Hoyt, USDA spoke on the activities of the bureau of entomology and plant quarantine, of which he is chief.

George C. Decker, University of Illinois, discussed the residue problem.

And a panel on exports completed the program. This consisted of: John H. S. Barr, Vice-President, Pennsalt International Corporation.

Earl R. Beckner, Chief, Chemicals and Semi-manufactured Products Branch, Manufactured Products Staff, Office of International Materials Policy, U. S. Department of State.

Phillip H. Groggins, Chief Agricultural Chemicals Section, Chemicals Division, National Production Authority, U. S. Department of Commerce.

Dr. Ralph Stewart, Director, Agricultural Products Division, Office of International Trade, U. S. Department of Commerce with Wallace S. Moreland presiding.

DOMESTIC PESTICIDE REQUIREMENTS FOR 1953

Address by
HAROLD H. SHEPARD

Office of Materials nd Facilities
PMA, USDA

Pesticides must be available in quantities adequate to provide for domestic needs. Otherwise food and fiber crops cannot be grown, processed and stored without expensive losses. Some uses of pesticides are fairly uniform and predictable from year to year. The scheduled applications to protect fruit orchards are in this class. Here the dealer and his supplier have some assurance that the grower will use quantities the next year similar to those he used during the preceding season. On the other hand, truck crops and cotton, for example, are often subject to severe losses from pest activity, but much of the pest control on these crops is done only if and when damage begins to be apparent. Infestations on cotton being dependent upon such factors as weather, are as unpredictable in their variations as the weather. It is too late to manufacture the insecticide after the insect makes its appearance. We must have the extinguisher on the wall ready to use when a fire breaks out. We must have enough pesticides on hand to suppress forseeable infestations.

Serious insect infestations in 1950 resulted in a heavy demand so that inventories were generally at a minimum at the end of the growing season. In 1951, not only was production increased greatly to overtake domestic demand in most cases, but some of the more destructive pests failed to develop in serious numbers. As a result, producers' inventories of some materials in 1951 and 1952 became too large to be stored without hardship.

It can be expected that situations such as this—from shortage to oversupply-will recur. The pesticide industry, faced with such conditions has the alternative of carrying its surpluses over to the following season or exporting them to other consuming countries.

Estimates of Domestic Requirements of Major Pesticidal Chemicals Compared to Disappearance at Producer Level (x 1,000 lb.)

Chemical	1949-50	1950-51		1951-52	(Tentative) 1952-53	
	Disappearance	Estimated Requirement	Disappearance	Estimated Requirements	Maximum Requirements	Maximum Requirements
DDT	59,000	85,000	78,000	85,000	70,000	85,000
Benzene hexachloride (gamma basis)	8,600	10,000	9,600	11,400	9,500	11,400
(Includes lindane)	1/			(2,000)	(2,000)	(2,500)
Aldrin, chlordane, dieldrin, heptachlor, and toxaphene	40,000	63,400	60,000	87,250	65,000	90,000
Parathion	2,551	3,750	4,670	6,500	5,500	6,500
Lead arsenate	28,600		31,509	30,000	20,000	30,000
Calcium arsenate	38,739		39,276	45,000	15,000	40,000
Pyrethrum (imports)	9,371	7,076	1/	5,000	8,000	10,000
Rotenone root (imports)	9,847	7,027	1/	10,000	7,000	10,000
Sulfur, ground	538,592 2/	483,000	400,000 2/	530,000	356,300	423,000
Copper sulfate	108,480	109,600	100,000	105,000	90,000	105,000
Dithiocarbamates	1/	9,600	1/	20,000	18,000	22,000
2,4-D	17,600	22,000	23,494	28,000	28,000	32,000
2,4,5-T	1/	2,000	2,822	6,000	5,000	9,000

1/ Data not available
2/ Disappearance during the calendar year 1950 and 1951 respectively for all domestic uses.

Estimates of domestic pesticide requirements made by the Office of Materials and Facilities, Production and Marketing Administration, are based chiefly upon two sets of data, (1) reports of production and of inventory position received directly or indirectly from the industry, and (2) State estimates of the expected percentage shift in usage during the following crop year. Export data are not so generally available. Domestic disappearances at the level of the basic producer for a particular period is calculated from production by taking into account the relative inventory positions at the beginning and end of the period, then subtracting the amount exported if that information is available. The annual period in use by this office is the crop year from October 1 to the following September 30. Frequently domestic disappearance figures such as these, are spoken of as consumption, whereas a considerable proportion of the disappearance may have gone merely to fatten the distributional pipeline. Some thought is being given to appropriate means for estimating pipeline holdings, at least on a relative or percentage basis.

In the above table are presented our estimate of disappearance for the crop year 1949-50, of both requirements and the subsequently calculated disappearances for 1950-51, and the requirements for 1951-52. Requirements estimates presented in the past have indicated the quantities needed if reasonably heavy infestations were encountered during the year. It would appear of additional value to present these estimates so as to show both the quantity believed necessary to control maximum pest infestations likely to be experienced and the quantity for probable minimum over-all conditions. These two sets of estimates are given here for the 1952-53 crop year. Pesticides usually have a number of effective uses and these uses coincide to greater or less extent for the different chemicals. Not all uses will be at a maximum during the same season. If it were not for these facts, maximum requirement estimates would have to be higher for some of these pesticides.

It should be remembered that the present estimates for next year are made without benefit of complete disappearance data for the crop year 1951-52 or of State survey estimates of the expected shift in usage for

next year. These figures are, therefore, preliminary and tentative; on the other hand they are based upon extensive data accumulated over the past two seasons.

DDT.—DDT may be considered the leading synthetic organic pesticide. It is applied for many specific purposes, and its consumption will be more uniform from year to year than that of materials with fewer established major uses. Methyoxychlor and DDD both compete to some extent with DDT. The relative volume of usage of these materials, however, is small as compared to that of DDT.

In the 1949-50 crop year, production of DDT ran behind domestic demand and nearly 90 percent of production or 59,000,000 pounds appears to have been used in this country. In the year 1950-51, domestic disappearance was between 75 and 80,000,000 pounds, but this was less than 80 percent of the production during the period. It is believed that consumption of DDT in the United States in the next crop year will be between 70 and 85 million pounds.

Benzene Hexachloride. — Estimation of future requirements of benzene hexachloride is complicated by the fact that the use of lindane and some other high-gamma grades of this compound will probably come into increased usage for new purposes while other chemicals might partially displace lower grades of benzene hxachloride for some uses, as for instance against boll weevil on cotton. The **minimum** requirement of gamma benzene hexachloride for next season is estimated to be 9,500,000 pounds, including 2,000,000 pounds of lindane. In terms of 12 percent technical BHC this requirement would amount to about 79,000,000 pounds. The estimated **maximum** requirement for this material is 11,400,000 pounds on a gamma basis, equivalent to 95,000,000 pounds of 12 percent material. These figures may be compared to the domestic disappearance in 1950-51 of 80,000,000 pounds.

Aldrin, Chlordane, Dieldrin, Heptachlor, and **Toxaphene.** — Each of the materials,—aldrin, chlordane, dieldrin, heptachlor, and toxaphene, —is manufactured by a single producer, but all are more or less in competition. Not having as broad a use base at DDT, the minimum and maximum requirements of this group should exhibit a wider spread than the requirements of that insecticide. The individual chemicals included in this group differ markedly in their potency per unit of weight. Comparisons of these compounds as a group, therefore, perhaps do not mean too much. It is believed, however, that the 1952-53 requirements will be at least 65,000,000 pounds and possibly as high as 90,000,000 pounds.

Parathion. — Domestic consumption of parathion has increased steadily since its introduction, apparently amounting to 2,551,000 pounds in 1949-50 and 4,670,000 pounds in 1950-51. Minimum requirements in 1952-53 will probably be 5,500,000 pounds and usage may reach 6,500,000 pounds.

Lead Arsenate. — Disappearance of lead arsenate was about 30,000,000 pounds a year in 1949-50 and 1950-51. This year (1951-52) the disappearance will be appreciably less, presumably because of inventories at the beginning of the year. It seems reasonable, therefore, to estimate requirements of lead arsenate for 1952-53 at a minimum of 20,000,000 and a maximum of 30,000,000 pounds.

Calcium Arsenate.—As in the case of lead arsenate, disappearance of calcium arsenate was about the same in 1950-51 as in 1949-50, amounting to around 39,000,000 pounds each year. Disappearance will be decidedly less in 1951-52, and estimates for 1952-53 are 15,000,000 pounds as a minimum and 40,000,000 pounds as a maximum. The large difference between these figures is caused by the fact that this insecticide is not only dependent upon boll weevil infestations on cotton, but it competes with several cotton insecticides which are effective against a much greater range of pests.

Pyrethrum Flowers. — Average annual imports of pyrethrum flowers for the three-year period 1949 to 1951 were about 8,000,000 pounds. This figure has been taken as the estimated minimum requirement of pyrethrum flowers for 1952-53. The maximum requirement is estimated to be 10,000,000 pounds, corresponding to the highest annual imports in that period.

Rotenone-bearing Roots. — Requirements of rotenone-bearing roots for 1952-53, estimated in a similar manner, are 7,000,000 pounds as a minimum and 10,000,000 pounds as a maximum.

Ground Sulfur. — Accurate information regarding the production of ground sulfur for pesticidal purposes is not available prior to 1949-50, and only rough estimates can be obtained for the rather large exports of pesticidal sulfur. Estimates of domestic consumption, therefore, are not as precise as for many of the other pesticidal materials. Since the quantity of sulfur used to control pests has decreased during the past two years from probably the highest consumption in 1949-50, it appears likely that domestic consumption in 1952-53 will be somewhere between 356,000,000 and 423,000,000 pounds. For comparison, the quantity of crude sulfur ground for pesticides during 1950-51 amounted to 524,000,000 pounds. Of this quantity a rather large amount was exported. Several factors seem to be in a large part responsible for the lower use of sulfur in 1952. These factors, which we expect will continue in 1953, are:

1. Synthetic organic fungicides and miticides developed recently have been demonstrated to be more efficient than sulfur and are coming rapidly into larger use.

2. Spray concentrates are replacing dusts in extensive areas. Since sulfur cannot be used in these concentrates, it has been displaced further by this trend.

3. Information on the need for conserving sulfur appears to have had considerable effect in extending the use of mixtures not containing sulfur.

Copper Sulfate. — Available evidence indicates that copper sulfate

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This valuable booklet will be sent to you with the compliments of your manufacturer who packs his product in Cotton Bags. Just mail the coupon with your name and address, the brand name of the fertilizer you buy, and your dealer's name and address.

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requirements, either for direct use as a fungicide or for manufacture of copper sulfate derivatives as fungicides, are between 90,000,000 and 105,000,000 pounds.

Dithiocarbamates. — These synthetic organic fungicides have an important role in the replacement of copper and sulfur. Their use is increasing and is expected to be in the vicinity of 20,000,000 pounds in 1952-53.

2,4-D — Consumption of this weed killer appears to be increasing steadily. Disappearances in 1950-51 was nearly 24,000,000 pounds. Requirements for the 1952-53 crop year are expected to be at least 28,000,000 pounds and possibly as high as 32,000,000 pounds.

2,4,5-T. — Disappearance of 2,4,5-T in 1950-51 amounted to 2,822,000 pounds. It is believed at least 5,000,000 pounds will be used in 1952-53 and perhaps considerably more than this figure.

The development of new weed killers for particular uses and the increased production of certain materials which have been in use for several years but to less extent than 2,4-D and 2,4,5-T complicates the estimation of weed killer requirements.

Except for certain specific crops and localities, it has not been possible with available facilities up to now to estimate pesticide requirements in general according to the crops to which they will be applied. An exception is the cotton crop for which some rather reliable historical data are available to assist in making such estimates. For instance, of the total domestic disappearance at the basic producer level during the crop year 1950-51, 20 percent of the DDT, 66 percent of the BHC, 94 percent of the combined disappearance of aldrin, chlordane, dieldrin, heptachlor and toxaphene, 69 percent of the calcium arsenate, 32 per cent of the parathion, and 30 per cent of the TEPP were consumed on the cotton crop that season.

Texas ABS Develops New Insecticide Unit

Development of a multi-purpose spray unit suitable for applying cotton defoliants and for application of insecticides to cotton, vegetables and other field crops has been announced by the Lower Rio Grande Valley Experiment Station, Weslaco, Texas.

The general purpose unit is designed to meet the desire of farmers for a spray unit that can be adapted easily to the different needs of Valley farms. These range from pre-emergence weed control on cotton and vegetables to application of defoliants to cotton.

The unit is economical in cost of construction and simple in operation, with emphasis placed on simple adjustment features from the standpoint of nozzle arrangement and ease by which drops and boom can be adjusted.

Chemicals Control Seed-Borne Diseases of Grains

American and Canadian scientists working on chemical treatments for control of seed-borne diseases of cereal crops have tested several new materials that are giving excellent results.

Evidence of the need of seed treatment of cereal grains is reported from the seed testing laboratory at the Experiment Station at Geneva, New York, where the seed analysts are finding stinking smut, scab, and black point fungi on seed wheat. All of these troubles may be controlled by good farm practices combined with thorough seed cleaning and chemical treatment, they state.

Mechanization

(Continued from page 21)

phosphate rock, barged from Florida. It is a high-capacity machine, capable of grinding 12½ tons of rock an hour, with low maintenance cost and high efficiency. It was made by Raymond Pulverizer Division of Combustion Engineering Superheater, Inc.

In the middle of the row is the new fertilizer mixer. Two new mixers have been installed in recent years, both by Ransome Machinery Company, subsidiary of Worthington Pump and Machinery Corporation. And next is one of two sacking units, equipped with Union Special sewing machines and Exact Weight scales. Over the years they have proven to give good service and to produce accurate weights.

The bottom row shows mechanical, labor-saving devices used in the plant. First, a Payloader working at a pile of superphosphate. Next a large Hough tractor which picks up a cubic yard at each scoop, shown loading a Clark "Tip" tractor with superphosphate. And finally, a general view of mechanical devices in use. Four other machines of this type, in use, are not shown in the picture.

Control Officials

(Continued from page 24)

soil amendments claim that the primary effect on ordinary soil was to stabilize the clay aggregate against the disbursing or slacking action of water. He pointed out these new polyelectrolyte soil conditioners generally do not come under the California Fertilizer Law. Although the California law classifies them as soil amendments, that is the class in which fall material such as hay, straw, peat, leaf mold and sand when applied to the soil.

Bulk fertilizer distribution not only in Virginia but in the United States was well-presented by Mr. M. B. Rowe, Department of Agriculture, Richmond, Virginia. Mr. Rowe presented the numerous problems that are being encountered in connection with the proper inforcement of bulk distribution of fertilizer and fertilizer materials. A survey by states show that some states were spreading from 1,000 to 165,000 tons anually.

Reports were made by the following investigators:

Gentral Terms, M. H. Snyder, Charleston, Va.; Nitrogen Products (Organic) M. P. Etheredge, State College, Miss,; Nitrogen Products (Inorganic), J. W. Kuzmeski, Amherst, Mass.; Phosphorus, J. F Fudge, College Station, Texas; Calcium and Magnesium, W. B. Griem, Madison, Wisconsin; Potash, R. W.

Ludwick, State College, N. M.; Manganese, J. B. Smith, Kingston, R. I.; Boron, Rodney C. Berry, Richmond, Virginia; Zinc and Copper, Gordon Hart, Tallahassee, Fla.; Mixing and Segregation, E. W. Constable, Raleigh, N. C.; Registration Forms, John L. Monaghan, Topeka, Kansas; Publications, Bruce Poundstone, Lexington, Ky.; Specimen Labels, F. W. Quackenbush, Lafayette, Ind.; Tonnage Reports, G. H. Laramie, Concord, N. H.; Pesticides in Fertilizers, A. B. Lemmon, Sacramento, Calif.; Specialty Fertilizers, E. A. Epps, Jr., Baton Rouge, La.; Bulk Fertilizers, M. B. Rowe, Richmond, Virginia.

The Model Fertilizer Bill was reported on by Dr. S. B. Randle, New Brunswick, New Jersey, while the executive report was made by G. W. Micheal, Ottawa, Canada. The following officers and executive committeemen were elected: Park A. Yeats, President, Oklahoma City, Oklahoma; H. B. Davis, Vice-President, Concord, N. H.; B. D. Cloaninger, Secretary-Treasurer, Clemson, S. C.; H. R. Allen, Lexington, Ky.; Dr. M. P. Etheredge, State College, Miss., and G. W. Micheal reelected. R. W. Ludwick of State College, New Mexico was elected chairman of the Executive Committee.

Markets

(Continued from page 54)

SULPHATE OF AMMONIA: Demand for domestic material continues strong and in excess of supply maintaining the domestic market in tight position. Supplies of imported material are available at prices around $55.00 to $56.00 per ton, bulk, f.o.b. cars at Atlantic ports.

AMMONIUM NITRATE: Domestic sources are heavily pressed to furnish against excessive demand. Prices remain firm and unchanged.

NITRATE OF SODA: Stocks are adequate and demand is seasonal with the price of Imported material at the ports $57.00 per ton f.o.b. cars, in bags.

IMPORTED CALCIUM AMMONIUM NITRATE: This material which was used quite largely in the Southeast last season, testing 20/21% Nitrogen is currently offered at $51.25 per ton bagged in paper or paper-lined burlaps, f.o.b. cars at Wilmington, N. C., Charleston, S. C., and Braithwaite, La., for fall and spring shipment.

GENERAL: Superphosphate continues in firm market position. Hard Nitrogen market is active and the Potash situation appears to be comfortable for the new season.

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	N	P_2O_5	K_2O
Monopotassium Phosphate (Crystals)	-0-	51.6%	34.2%
Diammonium Phosphate (Crystals)	21.0%	53.85%	-0-
Monoammonium Phosphate (Crystals)	12.2%	61.61%	-0-
Phosphoric Acid (75.0%) (Liquid)	-0-	54.5%	-0-

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DEMONSTRATION DUE AT SAFETY MEETING

Perhaps one of the most interesting demonstrations in the history of the National Safety Congress will be the demonstration of multiple shot blasting in fertilizer storage, from 8:30 to 11:30 a.m., October 23, 1952 at International Minerals and Chemicals Corporation, Chicago Heights. This method was developed in cooperation with an explosive manufacturer.

After much study and experimentation they recommended, instead of making single shots, a plan using multiple shots with delay action caps.

Until these tests, the company had followed a single shot practice, feeling that firing one shot would be safer than firing a number of holes simultaneously. Now the company is adopting the multiple shot plan just as fast as necessary equipment can be obtained and personnel properly trained.

In addition to changing to the multiple shot plan, the type of explosive was changed from what is ordinarily known as a 20% dynamite to a slower acting, low density, high gas volume explosive. This company states that this new program accomplishes to a great extent the elimination of over-hangs and slides. In addition, it has been pointed out that a well-planned multiple shot using fast delay action caps leaves the product in a well-fragmented condition which is much easier to handle than is the case with product from the single shot practice.

EXAMPLE OF A MULTIPLE SHOT:

Mixed goods stored from 20 to 22 feet deep, in a bay 24 feet wide, book-shelf type bulkheads on either side, was blasted with 39 sticks of powder, placed in fill holes, and fired with three stages of delay. The pile before the shot presented a typical pile face without overhang or visible hazard. After the shot, the product was very thoroughly fragmented with no large lumps. The shot had conditioned approximately 175 tons, and the blasted product inclined from the floor level to the top of the pile very evenly over a distance of about 30 feet, making the face of the pile flatter than the angle of repose. There were no overhangs or other hazardous conditions present.

Advantages of Multiple Shots:

The indicated advantages of the multiple shot program are about as follows: **First**—Safer—Less chance of overhang or dangerous slope being left after blasting. **Second**—Fewer blasts are necessary because several times as much product is brought down with each blast than is the average when firing single holes. **Third**—Less damage to buildings and bulkheads. **Fourth**—Greater efficiency per unit of explosive used. **Fifth**—Lower explosive cost.

Undoubtedly there is much more to be learned about the multiple shot, fast delay action cap method, but it seems logical to suppose that the way has been opened to safer handling of bulk goods in fertilizer plants. The multiple shot method should be given consideration but should not be attempted without expert coaching in the technique of handling.

This unusual demonstration will be the future attraction at the Fertilizer Section Meeting at the National Safety Congress in Chicago October 20-24. Mark Withey, explosives expert at the Trojan Powder Company, will do the actual demonstrating.

SOME OF THE LEADERS OF THE FERTILIZER SAFETY SECTION

1. A. B. Pettit, Davison Chemical. 2. Tom Clark, G.L.F. Soil Building Service. 3. Vernon S. Gornto, Smith-Douglass Company, Inc. 4. Edward O. Burroughs, Jr., F. S. Royster Guano Company. These men, plus other speakers, and others active in fertilizer safety work, will play a big part in the meeting of the Fertilizer Safety Section at the Sheraton Hotel, Tallyho Room, 2:30 October 23.

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FAO REPORT ON WORLD FERTILIZER STATUS

FIRST INSTALLMENT

PREFACE

This report has been prepared by the Agriculture Division of FAO and is based on data supplied by Governments up to July 20, 1952. Its purpose is to appraise and describe **current** world production and consumption of commercial fertilizers on a world, regional and country basis. For this purpose, the three-year period, 1950/51, 1951/52 and the outlook for 1952/53, has been taken. Thus, trends are presented while the world supply/demand position is still in a state of development. The only final statistics are for 1950/51. Figures for the years ending June 30, 1952 and 1953, because of the date of publication of this report, are necessarily estimates and are preliminary.

All of the major producing and consuming countries in each continent have supplied complete questionnaries and, with very few exceptions, outlook figures for 1952/53. Thus, the overall world and regional patterns of production and consumption given in this report are founded on official data provided by Governments.

Estimates from sources other than Government data have necessarily been used for some countries, chiefly the U.S.S.R. Zone of Germany and certain European countries which do not supply data and some others. As, however, the major part of the total world tonnage has been provided by Governments, it is considered that any variation between possible estimates for the minor part of the tonnage does not change the basic world patterns of production and consumption as established by official data. Estimates are marked*.

Statistics for continents and countries camparable to those found in the Appendix, Tables A to F, but for an earlier period, will be found in FAO Commodity Bulletin No. 17, **Commercial Fertilizers**, September, 1949, the FAO Commodity Report, **Fertilizers**, 1950 and FAO's report, Fertilizers: **A World Report on Production and Consumption**, August, 1951.

Table 1: Changes in the World Production 1/ of Nitrogen, Phosphoric Acid and Potash in 1951/52 over 1950/51.

	1950/51	1951/52	Percent Change
Nitrogen (N)	4,011	4,380	+ 9.2
Phosphoric Acid (P_2O_5)	5,770	5,945	+ 3.0
Potash (K_2O)	4,501	4,663	+ 3.6

1/ Metric tons are used in all cases.

Table 2: World Production Phosphate Rock 1/ for the years 1950/51, 1951/52 and 1952/53

	1950/51	1951/52 Estimate	1952/53 Preliminary
United States	10,827	11,177	11,500
North Africa	6,665	6,800	7,000
Ocean Island and Nauru	1,200	.....	.....
Christmas Island	290	308	310
U.S.S.R.	2,200	.....	.....

1/ Metric tons are used in all cases.

SUMMARY WORLD SITUATION AND OUTLOOK

1951/52 World Position

The world-wide trend toward the increasing use of commercial fertilizers noted in earlier annual reports continued in 1951/52. Not only does total production and consumption of fertilizers continue to rise, but the increase is partially marked in many regions in the world where the use of commercial fertilizers is relatively less. The outlook is that this trend will continue in 1952/53.

The total world production of nitrogen (N), phosphoric acid (P_2O_5) and potash (K_2O) in 1950/51 was 14,282,014 tons and in 1951/52, 14,988,342 tons an increase of 4.9 per cent. World consumption in 1950/51 and 1951/52 was 13,778,335 tons and 14,472,410 tons respectively.

The world consumption of phosphoric acid (P_2O_5) in 1951/52 over 1951/52 was larger than was anticicent in contrast to increases of 8.6 per cent for nitrogen and 7.8 per cent for potash. While the world production of superphosphate in 1950/51 increased by only 0.6 per pated earlier in 1951, the supply available in 1951/52 was insufficient to meet the needs of all consuming areas. Consumption of phosphates declined in some regions.

1952/53 Outlook

The outlook for 1952/53 is for a further increase of 7.1 per cent in the total world production of all fertilizers and an increase in the total consumption of all fertilizers of 8.6 per cent.

The greatest increase in 1951/52 over 1950/51 was in the production of nitrogen (9.2 per cent). The outlook in 1952/53 over 1951/52 is for the greatest increase to be in the production of potash (8.8 per cent), followed by nitrogen (7.4 per cent) and phosphoric acid (5.6 per cent).

Should the outlook for an increase of 8.6 per cent in consumption develop, the anticipated increase in

fertilizer production would be required.

Several important factors however, affect the implementations of the increase in 1952/53. Among them is an adequate supply of phosphates in some regions to enable the greater increase in the production of nitrogen and potash to be fully used in balanced fertility programs. Failing an adequate supply, it is possible that some nitrogen, and particularly potash since the increase is relatively larger, may not be used to advantage particularly in those regions that require all three plant nutrients.

While the supply of phosphates has improved and while the outlook is for still further improvement, an adequate supply, particularly of superphosphate in those countries most dependent on this fertilizer, is still the heart of the fertilizer problem in 1952/53.

A sound appreciation of the fertilizer supply/demand position requires a detailed appraisal in terms of regional conditions. For this reason, an analysis by continents and, as far as possible, by countries is given in the last section of this report.

This brief summary is amplified in the sections which follow.

WORLD PRODUCTION

In 1951/52 the world production of nitrogen (N) increased over 1950/51 by 9.2 per cent, much more than any other fertilizer and was followed by potash which increased over 1950/51 by 3.6 per cent. The overall increase in the production of phosphatic fertilizers (superphosphate, basic slag, concentrated phosphates, guano and other forms) was 3 per cent. These data are shown in the table on page 66.

Nitrogen

While the output of nitrogen increased in nearly all producing countries, of particular signficance are two important developments.

For the first time in history, synthetic nitrogen fertilizers are now being manufactured in commercial quantities for fertilizer purposes in every continent in the world. In 1951/52, for the first time, Egypt produced 27,000 tons of nitrogen and 180,000 tons of calcium nitrate. Previously, fertilizer nitrogen was not produced in Africa.

On a percentage basis the largest increase in nitrogen production was in Asia (18.6 per cent in 1952 over 1951). This relatively larger increase is accounted for chiefly by the production of sulphate of ammonia at the new plant in India (Sindri) and a larger production in Japan of sulphate of ammonia, ammonium nitrate, urea and smaller increases of ammonium chloride, nitrophosphate and ammonium phosphate. Other increases were the production of calcium cyanamid in Traiwan and a new production of 1,800 tons of calcium nitrate in South Korea.

Table 4: Increases in the Consumption of all Fertilizers (Nitrogen, Phosphoric Acid and Potash) in 1951/52 over 1950/51.

	1950/51	1951/52	Percent Change
Nitrogen (N)	3,930	4,268	+ 8.6
Phosphoric Acid (P_2O^5)	5,708	5,743	+ 0.6
Potash (K^2O)	4,140	4,461	+ 7.8

Metric tons are used in all cases.

Table 5. World Production of All Fertilizers (N, P_2O_5 and K_2O) for the Years 1950/51, 1951/52 and 1952/53.

	1950/51	1951/52	1952/53	Percentage Change, 1951/52 over 1950/51	Percentage Change, 1952/53 over 1951/52
Nitrogen	4,011,103	4,379,654	4,705,864	+9.2	+7.4
Phosphoric Acid	5,769,897	5,945,045	6,277,035	+3.0	+5.6
Potash	4,501,014	4,663,643	5,066,000	+3.6	+8.8
TOTAL	14,282,014	14,988,342	16,048,899	+4.9	+7.1

Table 6. World Consumption of All Fertilizers (N, P_2O_5 and K_2O) for the Years 1950/51, 1951/52 and the Outlook for 1952/53.

	1950/51	1951/52	1952/53	Percentage Change, 1951/52 over 1950/51	Percentage Change, 1952/53 over 1951/52
Nitrogen	3,930,054	4,268,353	4,639,255	+8.6	+8.7
Phosphoric Acid	5,708,370	5,743,148	6,140,148	+0.6	+6.9
Potash	4,139,911	4,460,909	4,939,969	+7.8	+10.7
TOTAL	13,778,335	14,472,410	15,719,372	+5.0	+8.6

Table 7. Types of Nitrogen Materials Produced in the U.S.A., 1951/52, in Terms of Tons of "Dry" and "Wet" Nitrogen.

Material	Tons Nitrogen (N)
DRY NITROGEN	
From Synthetic and Byproduct Ammonia	
Ammonium sulphate	291,000
Ammonium nitrate	178,000
Other solids 1/	86,000
Natural Organics	36,700
TOTAL	592,600
WET NITROGEN	
From Synthetic and Byproduct Ammonia	
Nitrogen solution compounds 2/	306,100
NH_3 for ammoniation	44,800
NH_3 for direct application	125,170
TOTAL	476,070

1/ Includes ammonium phosphates, sodium nitrate, urea mixtures, calcium nitrate, cyanamid and nitrophosphate.

2/ Includes estimated nitrogen content derived from solutions and ammonia in exported ammoniated superphosphates and mixed fertilizers.

In 1951/52 the increases in nitrogen production in Europe were 7.7 per cent and in North America 9.1 per cent. Although maintained at a high level, nitrogen production in South America declined slightly in 1951/52.

PHOSPHATE ROCK

Four areas supply most of the phosphate rock used in the manufacture of chemical phosphate fertilizers. They are the United States, North Africa, the Islands of the Pacific and Indian Oceans, and the U.S.S.R. This is due to the fact that the most efficient process now in customary use for the manufacture of phosphate fertilizers requires that the phosphate rock be of the highest grade possible, i.e. 30 per cent P_2O_5 or more. While mineral phosphates are widely scattered throughout the world, ores of the above grade in sufficient volume have been found in comparatively few places. Table 2 indicates the major world phosphate production for the current period.

All the production of Ocean Island and Narau and Christmas Island, with the exception of certain quantities of ground rock phosphate (38 per cent P_2O_5) exported from Christmas Island to Malaya, goes to Australia and New Zealand. Since 1950, exports from Curacao have stabilized around 91,500 tons. Egypt produced 400,000 tons in 1950/51, and this production is increasing with plans to manufacture enough phosphoric acid to meet indigenous needs. Reports indicate that the production and exports of high grade phosphate material from Jordan are currently 18,000 tons per annum. Production capacity is, however, much larger. The chief problem in increasing exports is securing a satisfactory sea outlet.

Israel increased the production of single strength superphosphate from 850 tons P_2O_5 in 1950/51 to 6,800 tons in 1951/52. The outlook is for a further increase in production. High grade indigenous phosphate ores are used.

Phosphoric Acid

Within the overall world production of phosphoric acid, the total production of superphosphate increased only slightly. In terms of P_2O_5 for the countries that reported by types of fertilizer for the two years in question it was practically the same in 1951/52 as in 1950/51—4,170,000 tons and 4,140,000 tons respectively, an increase of 30,000 tons or 0.7 per cent.

Superphosphate production in 1951/52 declined over 1950/51 in the United States, the Netherlands, the United Kingdom and in India. Production in all other reporting countries in 1951/52 was either the same as in 1950/51 or increased.

The production of basic slag, an important source of supply in

TABLE A. NITROGEN: Production for Years Ending 30 June 1951, 1952 and 1953.

Continent and Country	1950/51	1951/52 Preliminary	1952/53 Outlook
		. . . Metric Tons N . . .	
EUROPE			
Austria	74,900	94,750	100,700
Belgium	173,357	214,269	215,000
Czechoslovakia	30,000*	30,300*	30,300*
Finland	440	400	16,000
France	259,030 1/	285,000	305,000 2/
Germany — Federal Republic	464,677	500,000	520,000
Soviet Zone	205,000*	205,000*	213,000*
Hungary	4,000*	4,000*	4,000*
Italy	177,301	186,000	225,000
Netherlands	189,053	226,500	245,000
Norway	160,747	159,404	164,795
Poland	65,000*	65,000*	65,000*
Spain	6,600	7,000*	7,000*
Sweden	25,426	16,028	24,659
Switzerland	14,000	14,000*	14,000*
United Kingdom	275,000	278,900	286,000
Yugoslavia	3,864	4,564	4,562
Total	2,128,395	2,291,115	2,440,016
NORTH AND CENTRAL AMERICA			
Canada	149,208	149,208	161,208
Mexico	13,054	15,000*	15,000*
United States	996,000	1,099,000	1,202,000
Total	1,158,262	1,263,208	1,378,208
SOUTH AMERICA			
Brazil	3,500*	3,500*	3,500*
Chile	242,583	234,660	234,660*
Peru	35,440	36,000*	36,000*
Total	281,523	274,160	274,160
ASIA			
India	8,417	37,998	71,120
Israel			2,000
Japan	414,595	456,770	480,000
Korea, South		306	1,122
Taiwan	6,112	13,849	14,320
Turkey	588	840	1,050
Total	429,712	509,763	569,612
OCEANIA			
Australia	11,011	11,308	10,668
New Zealand	2,200 3/	2,200 3/	2,200 3/
Total	13,211	13,508	12,868
AFRICA			
Egypt		27,900	31,000
Total		27,900	31,000
WORLD TOTAL	4,011,103	4,379,654	4,705,864

1/ In addition, 6,900 tons of N used for industrial purposes.
2/ An average of given approximates, 300,000 to 310,000 metric tons.
3/ From organic sources.

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation. All data are exclusive of the U.S.S.R..

NOTE: Revised figures from Chile for the production and consumption of nitrogen, phosphoric acid and potash will be found on page 32.

TABLE B. **NITROGEN: Consumption for Years Ending 30 June 1951, 1952 and 1953.**

Continent and Country	1950/51	1951/52 Preliminary	1952/53 Outlook
		. . . Metric Tons N . . .	
EUROPE			
Austria	22,542	25,000	25,000
Belgium	78,000	77,500	78,000
Czechoslovakia	40,000*	40,000*	40,000*
Denmark	70,000	73,000	75,000
Finland	17,398	25,000	30,000
France	262,100	280,000	315,000 1/
Germany — Federal Republic	361,562	380,000	400,000
Soviet Zone	184,000*	191,000*	196,000*
Greece	22,000	35,000	40,000*
Hungary	1,400*	1,400*	1,400*
Iceland	2,400	2,700	2,900*
Ireland	8,197	10,200	11,220
Italy	156,500	158,000	170,000
Luxembourg	3,130	3,400	3,600
Malta	163	154	183
Netherlands	165,978	160,000	165,000
Norway	30,699	32,000	33,000
Poland	75,000*	75,000*	75,000*
Portugal and DOT	31,870	33,000	34,000*
Spain	56,600	60,000*	60,000*
Sweden	67,999	72,542	80,314
Switzerland	9,000	8,500	9,000*
United Kingdom	218,800	175,000	220,000
Yugoslavia	6,135	7,964	8,213
Total	1,891,473	1,926,360	2,072,830
NORTH AND CENTRAL AMERICA			
Barbados	2,427	1,800	1,800
Canada	32,659	32,659	34,500*
Costa Rica	2,859	3,000*	3,000*
Cuba	19,939	25,687	27,000*
Dominican Republic	1,200	1,600	1,800*
Honduras	406	416	325
Jamaica	3,093	3,198	3,350
Mexico	12,500	16,000*	16,000*
St. Lucia	87	113	145
St. Vincent	118	72	195
Trinidad and Tobago	2,315	2,507	2,305
United States and Possessions	1,166,000	1,275,000	1,379,000
Total	1,243,603	1,362,052	1,469,420
SOUTH AMERICA			
Argentina	6,500*	6,500*	6,500*
Brazil	12,000*	13,000*	13,000*
British Guiana	3,005	3,200*	3,200*
Chile	8,369	9,000	9,000*
Colombia	3,000*	3,200*	3,200*
Peru	37,680	39,630	41,000*
Uruguay	300*	500*	500*
Surinam	150	180	200
Total	71,004	75,210	76,600
ASIA			
Burma	141	285	285*
Cambodia	11	21	21*
Ceylon	12,921	13,500	14,000
Cyprus	1,214	1,400	1,500*
India	46,650	62,998	108,120
Indonesia	10,290	11,445	10,000
Iraq	151	160	170
Israel	7,500	13,000	15,000*
Japan and Ryukyus	442,000	442,000	442,000
Korea, South	14,598	48,189	80,010
Lebanon	1,480	1,550*	1,550*
Malaya	4,631	7,350	8,000*
New Guinea	2	2	2*
North Borneo	38	50	70
Pakistan	6,000*	6,000*	6,000*
Philippines	13,600	22,500	35,000
Sarawak	15	22	22*

Concluded page 70

Europe, increased for each of the three years as follows (for reporting countries):

1951:	767,025	tons	P_2O_5
1952:	797,850	tons	P_2O_5
1953:	800,795	tons	P_2O_5

Of primary importance in appraising the possible supply of phosphatic fertilizers is the degree of dependence on superphosphate which varies considerably from one continent to another. Current data indicate that this degree of dependence in 1951/52 was approximately as follows:

Table 3:

Relative Amounts of Phosphoric Acid Supplied in the Form of Superphosphate, 1952, by Continents.

Continent	Percentage
Oceania	100
Africa	99
North and Central America	92
Asia	87
Europe	54
South America	38

The production of the kinds of fertilizers which do not require sulphur, or only minimum amounts, in their manufacture also increased. Important among this kind of phosphatic fertilizer is the possibility of substituting nitric acid for sulphuric acid in the extraction of phosphate rock in the production of nitrophosphate.

Among other kinds of phosphate fertilizers not requiring sulphur are defluorinated phosphate rock (as fused tricalcium phosphate) and Rhenania phosphates. The production of ammonium phosphates in North America and Europe increased.

Plant capacity for the production of triple superphosphate (42 to 48 per cent P_2O_5) has been substantially increased, as, for example, in the Netherlands, the United Kingdom, North Africa, Portugal, Greece, the United States and possibly other countries. However, as elemental sulphur is required by many of these plants, it is possible that due to the world shortage this increased plant capacity is not being fully utilized.

Potash

The production of potash is principally centered in Europe and North America. In both regions production increased in 1951/52 over 1950/51. The outlook is for an increase of 8.8 per cent in total world production in 1952/53—the largest increase for any plant nutrient. There has also been an increasing trend towards the production of potash materials containing a higher concentration of K_2O. Increasing quantities of potash, as potassium nitrate, are being produced in Chile in connection with the new solar process of producing nitrate of soda. The increase in world production of potash in 1951/52 over 1950/51 was 3.6 per cent. (See table E. Potash Production).

WORLD CONSUMPTION

It is estimated that the world consumption of nitrogen (N), phosphoric acid (P_2O_5) and potash (K_2O) increased in 1951/52 over 1950/51 by 694,000 tons or 5.0 per cent.

Of current importance is the status of phosphate consumption. Although the total world supply of phosphates of all kinds in 1951/52 was much higher than was estimated in June of 1951,[1] the supply available for the year, particularly in countries chiefly dependent on superphosphate, was insufficient to fully meet the needs of all consuming areas. Rationing of superphosphate to farmers, above certain minimum quantities, was adopted in some states in Australia; and in South Africa superphosphate was diluted with rock phosphate. In New Zealand it was diluted with rock phosphate and serpentine.

The chief phosphate producing countries helped to meet the needs of other countries, to some extent at the expense of a somewhat lower consumption in their own countries. In Europe, for instance, on the basis of reports from 14 European countries, the estimated export surplus of nitrogen increased in 1951/52 over 1950/51 by about 30 per cent, while the increase in the net exports of phosphoric acid (P_2O_5) was much higher, about 60 per cent. At the same time, the production of phosphoric acid in these reporting countries was somewhat higher in 1951/52 than in 1950/51. Imports, however, declined and consumption was about 1.9 per cent less. This was in contrast to an increase in the consumption of nitrogen and potash of 1.8 per cent and 7.9 per cent respectively.

In North America, due largely to the need for substantial quantities of elemental sulphur for industrial purposes and to supply export requirements, the available supply and consumption of phosphoric acid (P_2O_5) in the United States in 1951/52 was slightly less than in 1950/51.

The largest increase in the consumption of nitrogen in 1951/52 was 124.3 per cent in Africa. Increases in potash consumption were particularly evident in Oceania (53.3 per cent) and in Asia (34.5 per cent).

An increasing number of countries are becoming interested in the use of commercial fertilizers. In 1951/52, for instance, nitrogen consumption was reported in 88 countries or territories located in all parts of the world; and the consumption of phosphoric acid and potash was reported in 70 countries or territories. The total number of consuming areas would be even larger if all dependent overseas territories were listed separately.

WORLD PRICES AND SUBSIDIES

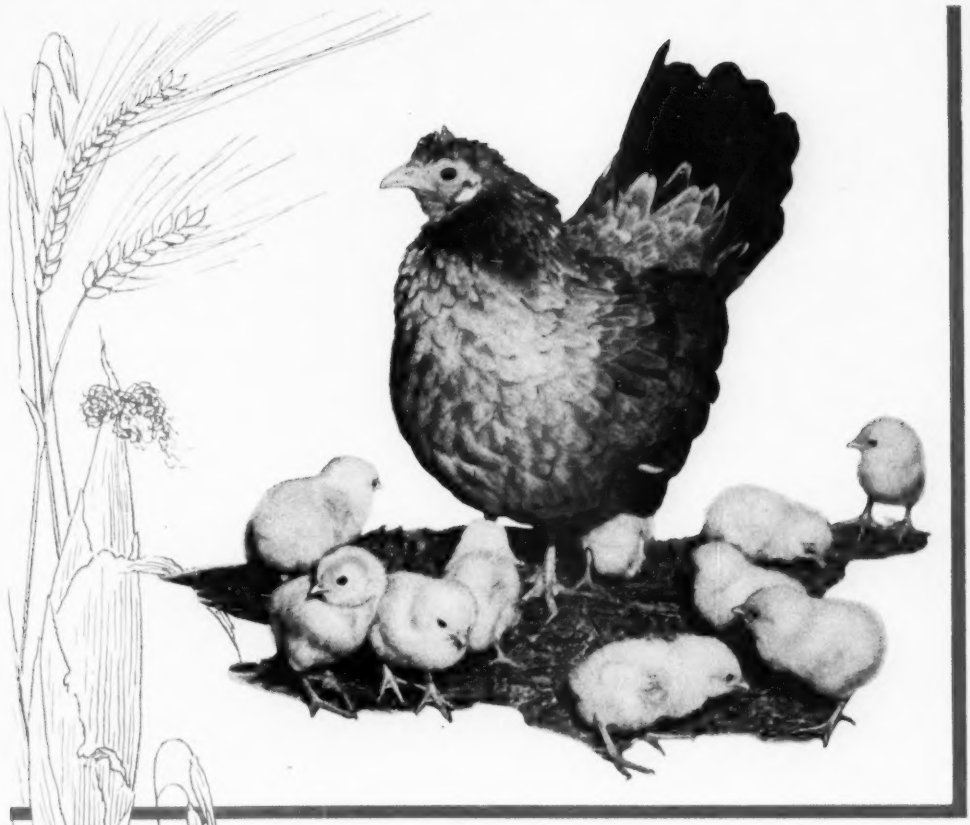
In line with rising commodity prices, the price level of commercial fertilizers rose in many agricultural regions in 1951/52 over 1950/51. In some areas, the price of phosphates has risen more than the prices of

TABLE B. **NITROGEN: Consumption for Years Ending 30 June 1951, 1952 and 1953** (Concluded)

Continent and Country	1950/51	1951/52 Preliminary	1952/53 Outlook
Syria	199	793	1,000*
Taiwan	61,279	76,215	80,000
Thailand	1,015	2,024	3,030
Turkey	2,738	6,840	9,050
Viet-Nam	2,807	3,370	3,650
Total	629,280	719,714	818,480
AFRICA			
Anglo-Egyptian Sudan	5,000*	5,500*	5,500*
Belgian Congo	200*	230*	230*
British Africa:			
Gold Coast	17	20*	20*
Kenya	125	420	840
Nyasaland	1,100	1,300	1,500*
Nigeria	1,407	1,856	2,000*
Northern Rhodesia	275	300	350
Southern Rhodesia	1,870*	2,000*	2,000*
Tanganyika	900	900	1,000*
Uganda	300	300	300*
Zanzibar	1	1	1*
Other Countries	1,200*	1,500*	1,500*
Egypt	42,533	130,118	143,400
Libya	100*	120*	120*
Liberia	3	2	4
Madagascar	300*	350*	350*
Mauritius	5,852	6,040	6,040
Reunion	1,200*	1,500*	1,500*
Union of South Africa	12,000	14,000	14,000
Total	74,383	166,457	180,655
OCEANIA			
Australia	16,226	15,575	18,135
New Zealand	3,300	2,200	2,200
Fiji	785	785	935
Total	20,311	18,560	21,270
WORLD TOTAL	3,930,054	4,268,353	4,639,255

1/ Average at given approximation.

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation. All data are exclusive of the U.S.S.R.



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chemical ammoniates or potash. In part, this may be attributed to the overall world shortage of phosphates. The prices of organic ammoniates, however, have risen much more steeply. In some areas it is reported that prices may be a limiting factor in consumption in 1952/53. In some regions, also, the prices of agricultural products or farm prices rose much more than the price of fertilizers, thus the farmer was in an advantageous position to purchase fertilizers. In other areas the prices of agricultural products were not favorable to the purchase of fertilizers.

The trend of agricultural prices is an important factor in the implementation of a larger consumption in 1952/53. Many Governments are paying various types of subsidies. Among these countries in Europe are Norway, Germany, Portugal and Austria. The United Kingdom has restored the subsidy on phosphates. Under date of 25 April 1952, the Fertilizer Scheme of the United Kingdom, which applies to phosphates delivered to farmers during the period 1 July 1951 to 30 June 1952, designates the rates of payment on the various grades and types of chemical phosphates eligible for subsidy.

Some countries purchase and import the necessary fertilizer materials, as, for example, Colombia; others, such as Uruguay, pay part of the freight on shipments of fertilizers to the farmer. In the United States, assistance is given for the purchase of fertilizers for certain crops grown in soil building programs. Many countries are improving credit systems for the purpose of fertilizers.

The basic objective of growing world importance is the provision of commercial fertilizers best suited to the farmers' needs at reasonable delivered costs.

INTERNATIONAL TRADE

The data provided by member countries are insufficient to give a basis for estimates of the total trade, particularly since trade data of several important eastern European countries are unavailable.

TABLE C. TOTAL PHOSPHORIC ACID SUPPLIED BY SUPERPHOSPHATE, BASIC SLAGS AND OTHER FORMS OF PHOSHATE.
Production for Years Ending 30 June 1951, 1952 and 1953.

Continent and Country	1950/51	1951/52 Preliminary	1952/53 Outlook
		. . . Metric Tons P_2O_5 . . .	
EUROPE			
Belgium	262,848	264,885	266,025
Czechoslovakia	56,000*	56,000*	56,000*
Denmark	73,800	73,800	73,800
Finland	49,091	74,414	75,000
France	479,500	518,000	535,000
Germany—Federal Republic	373,779	400,000	400,000
Soviet Zone	26,000*	26,000*	26,000*
Greece	40,000*	40,000*	40,000*
Hungary	4,000*	4,000*	4,000*
Ireland	30,150	32,003	34,629
Italy	310,055	322,400	344,500
Luxembourg	89,293	94,080	88,000
Netherlands	166,362	156,500	165,000
Norway	19,025	19,760	20,500
Poland	50,000*	50,000*	50,000*
Portugal	71,509	72,000*	72,000*
Spain	140,000	145,000*	145,000*
Sweden	98,649	99,245	108,870
Switzerland	31,000	31,000*	31,000*
United Kingdom	278,300	255,300	313,000
Yugoslavia	6,377	6,619	8,160
Total	2,655,738	2,741,006	2,856,484
NORTH AND CENTRAL AMERICA			
Canada	105,041	105,041	155,041
Jamaica	157	177	212
Mexico	7,896	8,500*	8,500*
United States	2,067,000	2,055,000	2,232,000
Total	2,180,094	2,168,718	2,395,753
SOUTH AMERICA			
Argentina	9,000*	9,000*	9,000*
Brazil	13,500*	13,500*	13,500*
Chile	15,016	15,964	15,944*
Colombia	500*	500*	500*
Ecuador	52	60*	60*
Peru	24,000	25,000*	25,000*
Uruguay	300*	300*	300*
Total	62,368	64,324	64,324
ASIA			
India	14,000	13,000	22,000 1/
Israel	850	6,800	10,200
Japan and Ryukyus	231,734	284,740	312,420
Korea, South		225	900
Taiwan	8,736	12,314	13,680
Thailand	100	120	160
Turkey	2,560	2,880	2,560
Total	257,980	320,079	361,920
AFRICA			
Egypt	12,751	12,884	16,350
Kenya	540	900	1,800
Tunisia	8,660	9,500*	10,000*
Union of South Africa	115,000 2/	126,000 2/	126,000 2/
Total	136,951	149,284	154,150
OCEANIA			
Australia	345,966	379,134	321,904
New Zealand	130,800	122,500	122,500
Total	476,766	501,634	444,404
WORLD TOTAL	5,769,897	5,945,045	6,277,035

1/ Subject to availability of sulphur.
2/ Contains 20 per cent of rock phosphate.

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation. All data are exclusive of the U.S.S.R.

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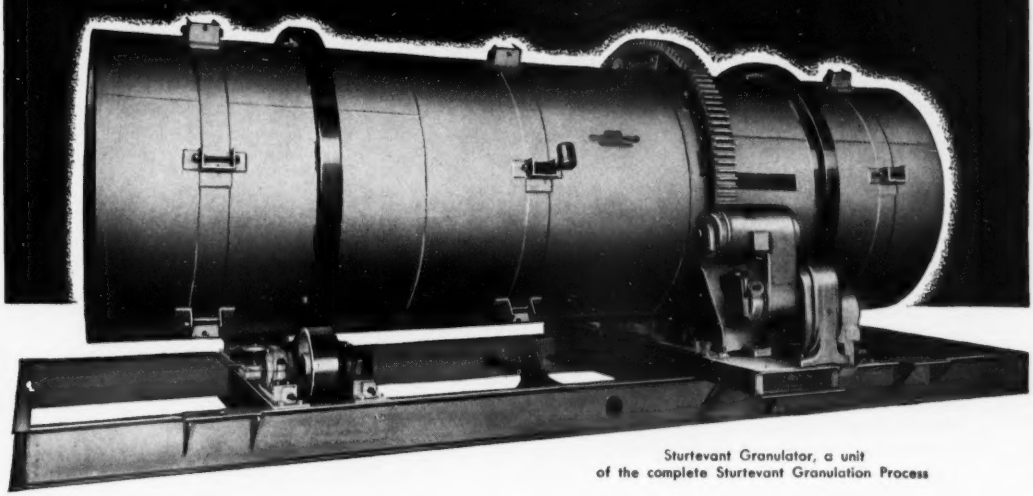

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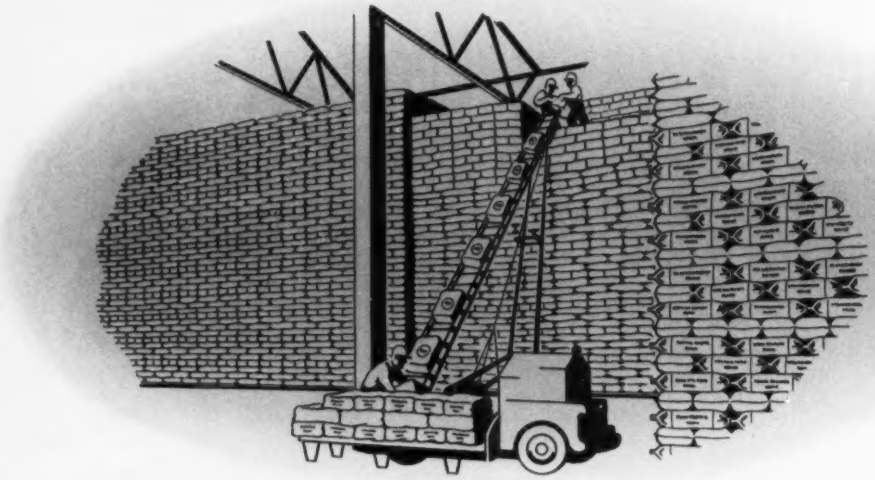

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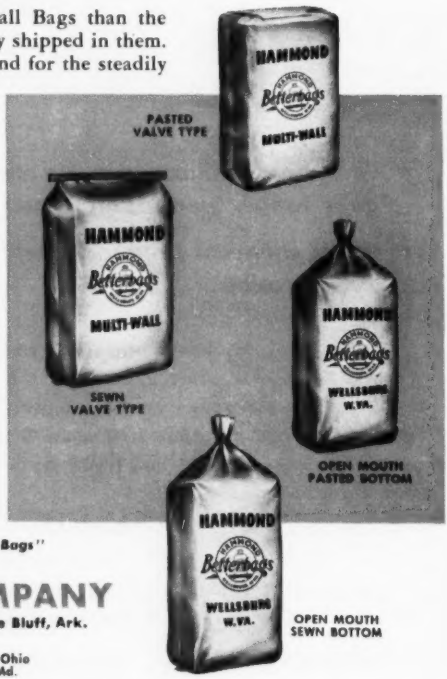

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A sufficient number of countries, however, have reported their imports and exports of fertilizers so that a description of the major outline of the trade position of the various continents is possible.

Europe

On the basis of the reports from 16 Western European countries, Europe is a net exporter of all three kinds of fertilizers. Of great importance in world trade are the exports of nitrogen, phosphoric acid and potash. The export surplus of nitrogen increased by about 30 per cent in 1951/52 over 1950/51. The reports indicate a continued, even though smaller, increase during the twelve-month period, 1952/53. Paralleling strongly decreased imports, somewhat lower consumption rates and a somewhat higher production in 1951/52 over 1950/51, the reporting countries showed a great increase (about 60 per cent) in the **net** exports of phosphoric acid in 1951/52 compared with 1950/51. The indications are that, while the 1952/53 export surplus of phosphoric acid will be smaller than that of 1951/52, it still will be larger than that of 1950/51.

North America

North America is a net importer of about 60,000 metric tons of nitrogen annually and of more than 200,000 tons of potash. It is also a net exporter of phosphoric acid.

South America

South America's position as a large-scale world supplier of nitrogen is unchanged.

Asia

It is worthy of notice that, according to the reports received, the rate of import of all fertilizers is still increasing in spite of the increased fertilizer production in Asia. 1951/52 imports of nitrogen, phosphoric acid and potash were, respectively, about 25, 100 and 40 per cent higher than in 1950/51. It is indicated that the increase will continue during the 1952/53 period.

Africa

Africa is a net importer of nitrogen and potash, with a reported annual rate of about 130,000 and 12 to 13,000 metric tons respectively.

Oceania

Oceania is a net importer of all fertilizers, the annual imports amounting to about 10,000 metric tons of phosphoric acid, 10,000 metric tons of nitrogen and about 15 to 20,000 metric tons of potash.

OUTLOOK 1952/53

Production: Agricultural Regions, All Fertilizers

Much more complete official data are available regarding the outlook for the year ahead than were available when last year's report was prepared.

The salient features of total production of all fertilizers for the period 1950/51 to 1952/53 are shown in table 5.

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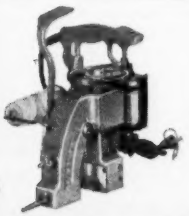

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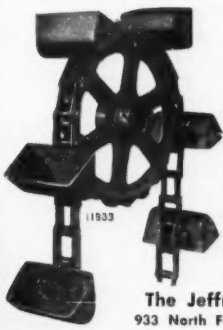

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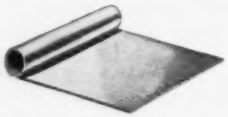

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The largest increase in 1951/52 over 1950/51 was in the production of nitrogen (9.2 per cent). The outlook is that in 1952/53 the largest increase will be in the production of potash (8.8 per cent), followed by nitrogen (7.4 per cent) and phosphoric acid (5.6 per cent).

On a geographical basis the largest percentage increase in total fertilizer production in 1951/52 over 1950/51 was in Africa (29.2 per cent), which was largely due to the new production of nitrogen in Egypt, and in Asia (20.6 per cent), due in part to the new nitrogen production in India.

On the basis of individual fertilizers, the outlook is that the largest increase in production in 1952/53 over 1951/52 will be, in the order named, potash in North America (17.9 per cent), phosphoric acid in Asia (13.1 per cent), nitrogen in Asia (11.8 per cent) and phosphoric acid in North America (10.5 per cent) in comparison with an average world increase in production of 7.1 per cent.

In contrast, the outlook is for a decline in the production of superphosphate in Oceania of 11.6 per cent. This is due to the anticipated shortage of sulphur for the manufacture of sulphuric acid.

Consumption

Changes in world consumption are shown in table 6.

A significant point is the relatively low increase in the consumption of phosphoric acid in comparison with the increases in the consumption of nitrogen and potash.

TABLE D. **PHOSPHORIC ACID: Consumption for Years Ending 30 June, 1951, 1952 and 1953 (Excluding Ground Rock Phosphate.)**

Continent and Country	1950/51	1951/52 Preliminary	1952/53 Outlook
		. . . Metric Tons P_2O_5 . . .	
EUROPE			
Austria	39,236	38,300	40,000
Belgium	79,600	82,030	83,000
Czechoslovakia	60,000*	60,000*	60,000*
Denmark	84,500	82,000	83,000
Finland	61,208	80,000	85,000
France	411,600	420,000	475,000
Germany—Federal Republic	411,424	440,000	448,000
Soviet Zone	66,000*	66,000*	66,000*
Greece	19,000	35,000	40,000*
Hungary	11,000*	11,000*	11,000*
Iceland	1,000	1,100	1,200*
Ireland	50,304	51,000	56,100
Italy	303,000	290,000	308,000
Luxembourg	4,655	4,495	5,135
Netherlands	119,961	109,000	120,000
Norway	34,233	35,000	36,000
Poland	60,000*	60,000*	60,000*
Portugal and DOT	57,000	60,000	63,000*
Spain	136,000	140,000*	140,000*
Sweden	105,483	105,750	109,295
Switzerland	33,000	34,000	35,000*
United Kingdom	380,300	276,400	353,000
Yugoslavia	6,377	6,619	8,160
Total	2,534,881	2,487,694	2,685,890
NORTH AND CENTRAL AMERICA			
Canada	105,347	105,347	125,347*
Cuba	19,348	26,635	29,000*
Dominican Republic	400	600	800*
Jamaica	333	574	477
Mexico	7,500	8,500*	8,500*
St. Lucia	57	84	88
United States	2,028,000	2,023,000	2,196,000
Trinidad and Tobago	514	457	453
Other Central Amer'n. Republics	800*	800*	800*
Total	2,162,299	2,165,997	2,361,465
SOUTH AMERICA			
Argentina	7,000*	7,000*	7,000*
Brazil	33,000*	33,000*	33,000*
Chile	11,857	14,000	14,000*
Colombia	5,000*	5,000*	5,000*
Ecuador	80	161	161*
British Guiana	141	150*	150*
Peru	24,000	25,350	25,350*
Uruguay	1,500*	1,500*	1,500*
Surinam	30	40	60
Total	82,608	86,201	86,221

Concluded page 77

Outlook: Production and Consumption, 1952/53 over 1951/52

The outlook is for total production of all fertilizers of 7.1 per cent and a world increase in the total consumption of all fertilizers of 8.6 per cent. Should this world increase be implemented, it is apparent that all the increase in production in 1952/53 would be needed to meet the demand. Whether or not an increase in world consumption of 8.6 per cent can be implemented depends on several important factors, such as the world level of fertilizer prices, possible changes in the level of agricultural prices, export/import problems, and transportation costs and facilities.

Experience shows that in all agricultural areas where commercial fertilizers are used there is a rough balance between the necessary plant nutrients usually used. While variations in normal usage are possible, on the whole, the amounts of nitrogen and potash that can be usefully used in 1952/53 depend to some degree on the amounts of phosphoric acid available, especially in countries that use all three plant nutrients.

In view of the prospective increase in nitrogen and potash production in 1952/53, it is all the more necessary that the supply of phosphates, especially superphosphates, be adequate to enable these much larger tonnages of nitrogen and potash to be used to advantage, otherwise an excess of these fertilizers may occur in some areas.

The world wants and plans to use more fertilizers. Whether this need can be met depends on these and possibly other factors, particularly those of a regional and local character.

TABLE D. **PHOSPHORIC ACID: Consumption for Years Ending 30 June, June 1951, 1952 and 1953 (Excluding Ground Rock Phosphate.)** (Concluded)

Continent and Country	1950/51	1951/52 Preliminary	1952/53 Outlook
ASIA			
Burma	100	140	205
Ceylon	2,075	2,500	3,000
Cyprus	3,392	3,500	3,500*
India	14,000	13,000	22,000
Indonesia	1,100	1,200	4,800
Iraq	43	45	30
Israel	6,500	22,000	22,000*
Japan and Ryukyus	237,670	242,470	257,570
Korea, South	1,217	19,427	23,431
Malaya	414	450	500*
Netherlands Guinea	3	3	3*
North Borneo	14	14	16
Philippines	6,600	13,500	20,000
Syria	95	303	303*
Taiwan	14,992	18,193	26,560
Thailand	100	300	500
Turkey	2,560	3,680	8,560
Viet-Nam	4,340	5,200	5,640
Total	295,215	345,925	398,618
AFRICA			
Egypt	21,856	12,884	16,350
Gold Coast	20	20*	20*
Kenya	3,900	4,470	4,530
Liberia	2	2	4
Mauritius	50	50	50
Nyasaland	250	300	300*
Northern Rhodesia	840	900	950
Tanganyika	120	150	150*
Tunisia	8,660	8,795	8,795*
Union of South Africa	108,000	119,000	122,500
Zanzibar	3	1	1*
Total	143,701	146,572	153,650
OCEANIA			
Australia	345,966	379,134	321,904
New Zealand	143,500	132,200	132,200
Fiji	200	200	200
Total	489,666	511,534	454,304
WORLD TOTAL	5,708,370	5,743,923	6,140,148

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation. All data are exclusive of the U.S.S.R.

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WORLD TRENDS: PRODUCTION FERTILIZER MATERIALS

Important trends are developing in the production and consumption of commercial fertilizers throughout the world. In view of their marked influence, a brief summary of four such changes is given here.

1) **The increasing world production of materials supplying higher concentrations of plant nutrients: nitrogen, phosphoric acid and potash.** (Note for the convenience of sequence in this summary statement, nitrogen and potash are discussed first, followed by phosphoric acid.)

Nitrogen

In North America, Europe and the Far East (Japan) the production of higher analysis nitrogen fertilizers is increasing in some areas as ammonia solutions: anhydrous ammonia (NH_3), ammonium nitrate, ammonium phosphates and other types.

It is emphasized, moreover, that a wide range of nitrogen materials is available for the world's agriculture. Substantial tonnages of all available forms are necessary to meet the needs of the various systems of world crop production.

The nitrogen production patterns of North America and Europe vary as indicated below. In the U.S.A., a substantial percentage of the total production is "wet" nitrogen. A recent publication[1] gives the details of nitrogen produced in the U.S.A. in 1951/52 in table 7.

Canada produces ammonium nitrate, ammonium sulphate (synthetic and byproduct ammonia), ammonium phosphate (11-48-0 and 16-20-0) and cyanamid. In addition, ammonia solutions and anhydrous ammonia (NH_3) are used. Since in some cases these materials are the product of only one organization, complete details of tonnages are not available.

In Europe, the production of solid nitrogen produced for agricultural purposes is much larger than in North America. While data are not available from which a complete tabulation of the total tonnage for all European countries can be compiled, eleven producing countries in Western Europe have reported a total of 1,965,815 tons of nitrogen, giving the materials for the major part of the tonnage. Within this total tonnage, the following major nitrogen materials were produced in 1951/52:

Table 8. Types of Major Nitrogen Materials Produced in Europe in 1951/52.

Material	Tons Nitrogen (N)
Ammonium sulphate	662,871
Ammonium nitrate	467,541
Calcium nitrate	276,800
	1,407,212
Other forms 1/	558,603
	1,965,815

1/ This includes cyanamid, sodium nitrate, ammonium phosphate, urea, urephoska, nitrophoska, anhydrous ammonia (NH_3), ammonium chloride or ammonium chloride and lime, nitrophosphate and possibly other forms.

In Asia, sulphate of ammonia is by far the most important fertilizer, contributing a very substantial part of the total production. Other materials manufactured are cyanamid, urea, ammonium nitrate, ammonium chloride, ammonium phosphate and, recently small tonnages of nitrophosphate in Japan.

In Latin America, production consists of the well-known natural nitrate of soda and, more recently, sulphate of ammonia.

In Oceania, ammonium sulphate is manufactured, while in Africa calcium nitrate is produced. In these regions, the form of nitrogen manufactured is decided, in part, by the most suitable indigenous materials available, as in the case of cyanamid in Taiwan, although some sulphate of ammonia is now manufactured here also.

Potash

The concentration of K_2O in potash fertilizers has materially increased in recent years. For the world as a whole, the chlorides of potassium—muriate of potash (60 and 50 per cent K_2O), manure salts (20 to 40 per cent K_2O,) sylvinite (18 per cent K_2O) and kanit (12.5 per cent K_2O)—comprised an estimated 90 per cent of the total world production in 1951/52, and the sulphates—sulphate of potash (48 per cent K_2O) and sulphate of potash magnesium (22 to 30 per cent K_2O)—made up 10 per cent of the total volume.

In the U.S.A., 60 per cent muriate of potash is by far the most widely used potash fertilizer, comprising 76 per cent of the total K_2O delivered for agricultural purposes in 1951. The 50 per cent muriate of potash made up 15 per cent and manure salts 1 per cent of the total. Kanit is not sold in North America. The sulphates were 8 per cent of deliveries.

Substantial tonnages of 60 per

1 Memorandum by Secretary of Agriculture: U. S. Dept. of Agriculture. Washington April 22, 1952.

cent K_2O are produced in Europe. In France it is the most important grade. In Germany more 50 per cent muriate of potash is manufactured. Manure salts are, however, produced in Germany in larger tonnages than any other potash fertilizer. Kanit is also used. The data available, however, do not permit a complete tabulation. By the new solar process noted in another section, increasing tonnages of potassium nitrate are being produced in Chile.

Phosphoric Acid

Increasing plant capacities in Europe, North America and Asia (Japan) for the production of triple superphosphate (42 to 48 per cent P_2O_5) and the increasing production of ammonium phosphates of various analyses emphasize the trend towards the increasing concentration of P_2O_5 in phosphate fertilizer.

2) **The production of phosphatic fertilizers requiring the minimum or no sulphur.**

In current world manufacture, superphosphate is by far the most important phosphate material. Output, however, is limited in many areas due to an insufficient supply of sulphur. Largly for this reason, there is a growing interest in the possibility of producing fertilizers with the minimum or no sulphur. Substituting nitric acid for sulphuric acid in the acidulation of phosphate rock, is a good example.

Methods of manufacturing nitrophosphate differ in certain important respects. Briefly, one of the major differences is whether or not calcium nitrate is one of the final products.

When phosphate rock is treated with nitric acid, calcium nitrate is also produced as a fertilizer. The nitrophosphate essentially consists of ammonium nitrate and dicalcium phosphate.

Other methods of manufacture may use mixtures of nitric and phosphoric acids, nitric and sulphuric acids or modifications of extractions with nitric acid by which the calcium nitrate is removed and is not one of the final products.

Research work is being done in several countries. Nitrophosphate is produced commercially, especially in Europe where the production capacity is being increased. In North America, the U.S.A. is conducting research on four methods of producing nitrophosphate.

Among other kinds of phosphate fertilizers not requiring sulphur are defluorinated phosphate rock — as fused tricalcium phosphate (27 per cent P_2O_5)—made by melting phosphate rock in the presence of silica and water vapor to volalitize the fluorine and increase the availability of the P_2O_5.

Another type is Rhenania phosphate, manufactured by heating raw phosphate rock at high temperatures with alkali salts, usually soda ash and silica or possibly other materials. Germany, in particular, produces two kinds of Rhenania phosphate: fused phosphate (Palitia) and magnesium phosphate of lime (Camaphos). Chile also produces Rhenania-type phosphates by heating apatite with sodium nitrate and by fusing apatite with sodium sulphate, lime and charcoal.

Calcium metaphosphate (64 per cent P_2O_5) produced in the United States in increasing quantities, is manufactured by causing phosphate rock to react directly upon phosphoric acid at high temperatures.

More recent developments include the manufacture of "fused phosphates" in Asia (Japan) and Taiwan. In Africa, "soda phosphate" is manufactured in Kenya. Currently, the capacity is being doubled there. This material is made from Uganda phosphate (apatite), using only soda ash at a low temperature of 900°C. Soda phosphate is successfully being used in Kenya, chiefly on wheat and maize. The product in Taiwan is a serpentine fused phosphate.

3) **Modernizing the methods of utilizing natural resources for the production of fertilizer materials.**

This trend covers a variety of fields of activity. Outstanding in its importance to the world's nitrogen supply is the modernization of the Guggenheim process in the production of sodium nitrate in Chile based on five years research. The process has been further modernized to recover additional values from the tailings which were formerly discarded after leaching out only the sodium nitrate and part of the iodine. The tailings contain 25 per

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cent of the nitrate of the original ore (caliche) and all of the remaining salts. A solution of the tailings is subjected to fractional crystallization in four specially-built solar evaporation ponds, and the process is now producing substantial tonnages of potassium nitrate and other materials. The average analysis of the material is 31.2 per cent potassium nitrate and 67 per cent sodium nitrate, together with smaller amounts of sodium chloride and sodium sulphate, and containing traces of minor elements.

Another example of the application of modern methods in the utilization of natural resources is the production of guano in several countries, especially Peru. By successful conservation methods the decline in the production of white guano has been stopped, and the output is again increasing. In order to produce fertilizer of a higher concentration, a mixing plant has recently been built in Lima where guano, together with high analysis chemical fertilizers, are used to manufacture high analysis mixed fertilizers primarily for shipment to the more distant inter-Andes valleys.

4) Improvement in the physical condition of fertilizers

The improvement in the physical condition of commercial fertilizers facilitate their storage and more efficient application to the land has been further developed. An outstanding instance is the improved condition of ammonium nitrate since it first appeared on world markets. Granulation is also being applied to many types of fertilizers, phosphates, potash and mixed fertilizers in a number of countries.

CONCLUSION

The present upward trend in the production and consumption of commercial fertilizers started in the period of postwar rehabilitation. By 1946/47 world production and consumption had reached the level of 1938/39. Since then, a steady increase in the total volume has been reported each year and reached record world levels in 1951/52. Against this background, the outlook for still further increase in production and consumption in 1952/53 is a matter of some significance in relation to world crop and food production.

The supply of fertilizers available to the farmer is becoming a subject of growing concern in countries all over the world. As used in this context, supply means: fertilizers suited to the farmers' needs, delivered on the farm at reasonable costs which the farmer can afford to pay and available in adequate quantities to meet the local demand.

The above requirements of supply can be fully met chiefly in the countries of Western Europe, North America, Asia (Japan) and a few other countries. Progress is being made, however, in improving the supply in many countries.

Currently, the chief world production of chemical commercial fertilizers is largely geared to the highest grade of raw materials obtainable. As the world demand for fertilizers increases, the problem of supplying high grade raw materials becomes more difficult in many instances, as, for example, in the case of elemental sulphur.

Among the many kinds of work going on to improve the supply is the conservation of natural organic materials, more successful methods of utilizing natural resources by the more efficient extraction of plant nutrients from raw materials, the development of new sources of sulphur and surveys to locate new bodies of raw materials such as high grade phosphate rock in Asia and South America.

The use of indigeneous raw materials and the manufacture from such materials of other than conventional types of fertilizers is another development in countries short of the usual high-grade ores. Instances are the production of serpentine fused phosphate in Taiwan and soda phosphate in Kenya. These citrate soluble phosphates are successfully used in local crop production.

The search for suitable raw materials and their successful utilization as fertilizers is a matter of growing urgency in improving the supply for farmers, especially in many industrially under-developed regions.

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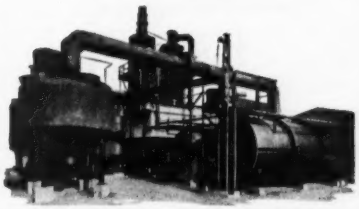

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